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Railway Reorganisation

THE Minister of Transport & Civil Aviation, Mr. Alan Lennox-Boyd, stated in the House of Commons last week that he had received from the British Transport Commission on April 15 the scheme for the reorganisation of the railways required to be submitted under the Act of 1953; the Act gave the Commission one year from its passage on May 6, 1953, or such longer period as the Minister might allow, so that progress on the scheme seems to be as far forward as the framers of the Act have envisaged. The Minister is consulting the interests specially concerned, after which, in consultation with the Commission, he must consider whether any alteration is desirable. He will then present the scheme, with any modifications, to Parliament, in the form of a White Paper. It will be some considerable time, therefore, perhaps a year, before the scheme is published in the form finally approved. The Act lays down that he must consult on the scheme with bodies representative of classes of persons likely to be specially affected by the reorganisation, and with the National Coal Board, as the greatest single railway user. In view of the special position of Scotland in the reorganisation of British Railways under

the Act, which provides for one railway authority to be set up for the whole of that country, the Secretary of State for Scotland is one of those to be consulted. The scheme as now submitted, after a number of consultations with the Minister, presumably conforms with the wishes of the Government, though these, in so far as they refer to organisation, are but vaguely expressed in the Act; but it may eventually take shape in a much modified form after the White Paper has been debated in Parliament. All this will take time. Meanwhile, the interim organisation at the headquarters of the British Transport Commission which came into being last autumn on the abolition of the Railway Executive, must continue to tide over the transitional period.

Metrovick Contract for C.I.E. Diesels

THE order for the diesel locomotives for which Coras Iompair Eireann issued tenders last September has been awarded to Metropolitan-Vickers Electrical Co. Ltd., which has secured it in the face of severe competition from America and the Continent. Thirty-one tenders are reported to have been made from a number of countries including the U.S.A., Canada, Belgium, France, Germany, the Netherlands, and Sweden. It is worth £4,750,000 and is the largest order for diesel locomotives ever placed in this country. The tender as first put out and recorded in our September 18, 1953, issue, called for either diesel-electric or diesel-hydraulic locomotives in three lots, of 50 and 40 mixed-traffic units of 1,100-1,400 and 550-700 h.p. respectively, and 15 units of 250-350 h.p. As finalised, however, the order comprises 60 1,200 h.p. six-axle and 34 550 h.p. four-axle diesel-electric locomotives. The electrical equipments will be manufactured by Metropolitan-Vickers at Manchester and Sheffield, the diesel engines by Crossley Bros. Ltd., Manchester, and the mechanical parts by Metropolitan-Cammell Carriage & Wagon Co. Ltd., Birmingham. Metropolitan-Vickers has gained this valuable order only a short time after concluding a £7,000,000 order to supply suburban electric stock for Brazil, which we reported in our issue of April 2.

Conversion of C.I.E. Motive Power

WHEN the delivery of the 94 diesel-electric locomotives from Metropolitan-Vickers is completed the greater part of the railway system of Eire will have been converted to diesel traction. The diesel railcars and multiple-unit trains are already a familiar feature of the services of Coras Iompair Eireann, and the advent of the new locomotives to haul heavier trains will complete the change-over, although the prototype steam locomotive, capable of burning turf, on which C.I.E. is now working, may, when followed by the 49 other locomotives of its class, still be responsible for much of the freight working. The saving in fuel costs resulting from the change is estimated to be in the region of £1,000,000 a year, and Mr. T. C. Courtney, Chairman of C.I.E., stated last week that it is hoped eventually to be able to reduce transport charges. The steam locomotives at present held by C.I.E. are to be broken up as scrap or sold, although gauge difficulties may hamper this latter course. It is anticipated that few employment problems will arise from the dieselisation programme, and the necessary re-modelling of workshops to suit the new locomotives may well result in increased employment. Further details of the plans for the changeover will be awaited with interest.

Generous Gesture by the L.M.A.

AT the annual meeting of the Transportation Club last week the Chairman, Mr. K. W. C. Grand, in his statement on the year ended December 31, 1953, announced an adverse balance on the income and expenditure account of £133; against this special donations totalling some £231 had been received during the year from its supporters in the transport industry, resulting in a surplus of £98. A brief account is given on another page. Mr. Grand, moreover, was able to read to the

meeting a letter which he had just received from the Locomotive Manufacturers' Association, enclosing a cheque for 250 guineas. The letter states that, in the view of the Association the unique facilities offered by the Club as regards the transportation industries are such that their continuation and development should be encouraged and the Club has done, and is doing, a good job in the midst of considerable difficulties and ought to be supported by all those who undoubtedly benefit from its facilities. In expressing to the Association the grateful thanks of Club members, Mr. Grand has expressed their great satisfaction, which will be felt in a very wide section of the world of railways and associated activities, that the L.M.A. feels, with other benefactors of the Club, that it is fulfilling a useful purpose and contributing to the work which transport must accomplish.

British Railways and the Tourist

FREEDOM from political disturbance to enable British Railways to improve their standards of comfort and performance was advocated by Mr. David Blee, Chief of Commercial Services of the British Transport Commission, in the course of a wireless broadcast discussion last week on the standards acceptable to foreign tourists in Britain. The time had come, he said, when the railways should be re-equipped and modernised, and in this they were thinking not in a small way, but in terms of hundreds of millions of pounds. British Railways, he maintained, were doing an immense job and, in the vast majority of cases, doing it well. The regularity of the services should be kept in mind. They handled 1,000,000,000 passengers a year and 1,000,000 tons of freight a day. Sir Alexander Maxwell, Chairman of the British Travel & Holidays Association, who also took part in the discussion, said that the tourist industry brought £126,000,000 a year into the country, of which £40,000,000 were in dollars, and Mr. Blee claimed that the railways, through their American, Canadian, and Continental offices, and their links with tourist agents throughout the world, had their finger on the pulse of the industry. The general reaction of the visitor to Britain, he said, was amazement at the frequency of the service, great satisfaction at the price of it, and surprise, especially from American tourists, at the number of non-stop runs of over 200 miles in these small islands.

Overseas Railway Traffics

CONTINUING reduced traffic on Canadian railways is reflected in lower earnings by the Canadian National Railways for March, and in the aggregate figures for the first three months of 1954 compared with last year. Gross operating revenues in March amounted to \$55,862,000, a decrease of \$4,527,000 against the corresponding month of 1953. Operating expenses totalled \$52,951,000 this year; last year they were \$56,089,000. Figures for the first quarter show a drop in revenues of \$12,103,000 and a reduction in operating expenses of \$11,750,000. The net revenue result is a deficit of \$2,469,000 for this year compared with a deficit of \$2,116,000 for 1953. Canadian Pacific gross earnings for March were \$36,791,000, against \$38,873,000 for March of last year, and working expenses \$33,071,000 and \$35,481,000 respectively; so that net earnings for March show an increase of \$328,000 over those of March, 1953. On the other hand, aggregate gross earnings for the first quarter of the current year at \$99,319,000 are \$10,452,000 less than for January-March of last year, and net earnings, at \$2,799,000, \$1,601,000 less.

Norwegian Railway Centenary

THE year 1954 marks the Centenary of the Norwegian Railways since the line was opened for passenger traffic throughout from Christiania—now Oslo—to Eidsvold on January 1, 1854. In fact the first 11 miles of the Norwegian Grand Trunk between Christiania and Stromen had been opened, for timber traffic only, in July, 1853, and a second section to Dahl, a total length of 36 miles, in the following

November. The company which constructed and opened the line had both English and Norwegian directors, the Chairman being J. L. Ricardo, M.P.; the other English directors were S. M. Peto and Thomas Brassey. The engineer for the railway was G. P. Bidder and, during the coming International Railway Congress in London, it is planned to present Mr. Stokke, General Manager of the Norwegian Railways, as a gesture of international railway friendship, with a small china bust of Mr. Bidder, which was the work of Wyon the sculptor in 1854. The presentation of the bust, which is the gift of Mr. C. E. R. Sherrington, will take place in the board room of *The Railway Gazette*. In a future issue we plan to deal at length with the history and development of the Norwegian railways, and it may be noted that the Norwegian Government is celebrating the occasion with special postage stamps, which were issued on April 30.

Improving an Indian Main Line

THE importance of the Itarsi-Bhopal section of the Central Railway can be gauged from the fact that the majority of the traffic between Bombay and Delhi and northern India, and virtually all that between Madras and southern and central India and the north has to pass over this link. It is remarkable that hitherto a single line has been able to carry the traffic, especially as it included the 12-mile, 1 in 80 rise of 528 ft. between Budni and Barkhera involving wholesale banking. The inset map on page 548 shows its position, and the article it accompanies describes the measures now taken to increase the capacity of the line and eliminate banking. The easing of the task facing ascending trains can better be appreciated when it is considered that the new gradient is 1 in 125 (0.8 per cent) compensated for curvature, whereas that of the old single line—now the “up” or descending road—1 in 80 uncompensated, is equivalent to about 1 in 67 compensated (1.5 per cent), so that the improvement is in the proportion of 8 to 15.

Modern Construction Methods

THE article makes it clear that no pains have been spared to ensure a stable formation for the new “down” line. The location in difficult terrain was unusually detailed and modern scientific practice was followed in the construction work. Up-to-date earth-moving plant was used for all the earthwork, and the care taken in both the laboratory and the field to counteract the high capillarity of the available soils, and to consolidate and systematically water the embankments is exemplary. Considerable ingenuity was also shown and applied by the railway staff in designing and fabricating what appears to be an extremely efficient pneumatic concrete-placing plant and its travelling frame and steel shuttering “cloak,” as well as mobile working shields and a “jumbo” frame for tunnelling. The framework for launching the 100-ft. bridge spans appears to be effective and robust, even if unusually elaborate. With limited plant and material available, there is a welcome sense of improvisation about the whole work. Nor were facilities for traffic-working overlooked, and the using of Midghat station for both old and new lines, and the provision for emergency, independent, both-way working of the four converging track-sections shows much forethought.

The Derailment at Abington

THAT the introduction of flat-bottom track has raised problems of its own is illustrated by the circumstances attending the derailment of the down “Royal Scot” express when descending Beattock bank on August 8, 1953. This had all the possibilities of a bad casualty list but, although the train broke up and some vehicles overturned, there was no fatality or case of really serious injury. The whole train was formed of the latest British standard all-steel stock with Buckeye couplings, the great value of which has been demonstrated in other accidents. The case was inquired into by Lt.-Colonel G. R. S. Wilson, Chief Inspecting Officer of Railways. His report is necessarily lengthy and detailed, but

its essentials are given in our summary in this issue. There was a repetition of the trouble, experienced elsewhere, of heavy flat-bottom track, following creep and expansion, pressing forward powerfully against weaker bull-head construction and developing undue stresses, which became released as the express passed. Much emphasis had indeed been laid in various instructions on the importance of avoiding such a situation, but they had been insufficiently appreciated by some, and an error of judgment was in fact admitted. However the position came about the lesson of the case was at once applied and energetic measures instituted throughout the Region to ensure adequate precautions being taken at all points of junction between the two types of track and provide the strength required to guard against a danger already responsible for a number of incidents.

The International Railway Congress

NEXT week the Sixteenth Session of the International Railway Congress Association begins in Church House, Westminster, the first meeting in London since the Tenth Session was held here in 1925. For some nine days the 450-500 delegates from more than 30 countries will have ample opportunity to discuss the questions on the official agenda, and to see for themselves some of the manifold activities of British Railways and of the British manufacturers who supply material to railways in Britain and in many countries overseas. They will see many new technical developments and changes on British railways in the past 29 years, some of these are referred to in the special issue of *The Railway Gazette* published on the occasion of the present Congress. The 11 questions for discussion by the five Sections of the Congress dealing with different aspects of railway work were listed in our issue of April 9. Nearly all are such as to interest officers of any railway in any part of the world, in widely varying economic and climatic environments, and are important in the light of new techniques.

Thus Section 1, which is concerned with civil engineering, in dealing with track maintenance, will discuss mechanisation—a topic much in the minds of railway civil engineers. One of the most controversial subjects, that of 50-cycle electric traction, can hardly fail to be debated by Section 2 (motive power), when it considers the characteristics of electric traction systems; this promises discussions of exceptional interest to railways in some less developed countries which are contemplating electrification, besides those in Western Europe and other more developed regions. Radiophonic communications in railway working and the remote operating of signalboxes are on the agenda of Section 3, which deals with questions bearing on operating; the former subject concerns railways in every part of the world, and recent developments in apparatus and practice add much to the interest of the latter.

Frequent reference to British Railways practice and studies is made in the reports on the 11 questions, which have been summarised in recent issues of this journal and in the current issue. Five of the 26 reporters on these questions are officers of British Railways or London Transport. *The Railway Gazette* also will be responsible for the daily bulletin made available to delegates each morning and summarising the previous day's proceedings in the several Sections.

Britain has much to show the delegates from overseas and Continental countries. The official visits arranged for delegates by the British Organising Commission for the Congress, in conjunction with British Railways and London Transport, show many aspects of British railway working. Amongst these, the electrical control rooms and substations of the Southern Region 50-cycle conversion scheme will show some aspects of power supply for the most intensive electrified suburban service in the world. The Southampton Docks visit will show a great port developed by railway enterprise. A visit will be paid to the

Rugby locomotive testing station, worthy of special study in the light of the question of locomotive efficiency on the agenda of the Conference. The London Transport Railway Rolling Stock Overhaul Works at Acton are especially noteworthy in their equipment and methods. The protection works on the Folkestone to Dover line of the Southern Region, which runs beneath the cliffs across a landslide, will attract the attention of civil engineers concerned with problems of erosion and soil mechanics. Most delegates will find much to interest them in the joint British Railways/London Transport exhibition of rolling stock and civil engineering and signalling equipment at Willesden.

Apart from these and the other official visits a number of trade organisations have co-operated with the Federation of British Industries to arrange a programme of industrial visits on May 27. Delegates have a choice of 74 works, engaged in the production of equipment and supplies for railways including locomotives, carriages and wagons, steel products, electrical apparatus, brake and signalling apparatus, cables, and plastics. The plants visited vary greatly in size, and include those of some of the largest and best-known firms in the world which build locomotives for railways at home and overseas. A notable feature is the number of firms supplying diesel locomotives and equipment—an indication of British activity in this field. On the recreational side, many excursions have been arranged which will show London and provincial towns and the countryside of Britain at their best in early summer.

The recognition by those in authority in this country of the importance of the Congress is shown in the acceptance of the honorary Presidency by H.R.H. the Duke of Gloucester, who performs the opening ceremony next Wednesday. The Minister of Transport & Civil Aviation, Mr. Alan Lennox-Boyd, will attend the principal functions and give a reception on behalf of H.M. Government in honour of delegates and their ladies. Monsieur M. de Vos, President of the International Railway Congress Association and General Manager of the Belgian National Railways, will be accompanied at major functions by the Chairman of the British Transport Commission, General Sir Brian Robertson who is President of the Session, the Deputy Chairman, Sir John Benstead, and other Members of the Commission, and civic representatives will attend the official opening.

British railway officers not only from this country, but from systems in the British Commonwealth, will play an important part in the discussions on the questions on the agenda dealing with the problems of most varieties of railway undertaking. The fact that officers of railways in some of the less developed countries will be able to pool their experiences with those of railwaymen from the highly developed railways of Western and Central Europe adds greatly to the value of the discussions. Much hard work has been and is being put in by the Arrangements Committee of officers of the British Transport Commission Headquarters, the Regions of British Railways, associated undertakings of the Commission and London Transport under the chairmanship of Mr. J. L. Harrington, of the British Transport Commission, to ensure the success of the Congress; this is in addition to the work of the Congress staff, with its English General Secretary, Mr. C. E. Whitworth, who has been seconded for this purpose from the headquarter staff of the Commission.

The exceptional interest of the agenda and visits, and the care exercised in making the arrangements should make the Sixteenth Congress an outstanding one. These sessions are the only railway meetings at which railway questions can be discussed academically—in the best sense—by railwaymen from any country in the world, for all but the smallest undertakings can participate as members; the International Railway Congress Association is not restricted in membership to railways in any one geographical group or other classification. This year, with the many developments achieved or in progress in railways in Britain, in the case of many difficulties, and with British

manufacturers playing an important part in the design and construction of material for railways in many parts of the world, it is particularly gratifying that the Sixteenth Session should be held in this country, and in London, for railways originated in Britain. British Railways are the most heavily trafficked system in the world, and London Transport is the world's greatest urban passenger transport undertaking.

The Next Step in 50-Cycle Traction

THIS summer the first locomotives for the French National Railways Valenciennes-Thionville 50-cycle electrification are due to begin running. The magnitude of this project, now to be extended to Lille, Forbach, and Réding as reported in our March 19 issue, is impressive evidence of the faith of the French authorities in the system of traction they have done so much to develop since the war. Two papers by S.N.C.F. engineers who have been prominent in this work were presented to the Institution of Electrical Engineers on May 6. Monsieur M. Garreau, Chief Officer for Electric Traction Development, dealt with the general characteristics of 50-cycle locomotives, while Monsieur F. Nouvion, Chief Engineer in that department, described the locomotives for the Valenciennes-Thionville electrification in detail.

In his paper Monsieur Garreau laid special emphasis on the characteristics of converter designs, which account for 85 out of the 105 locomotives originally ordered for the Valenciennes-Thionville line, and for 37 of the 55 additional machines authorised at the same time as the extensions mentioned above. He showed how the possibility of supplying d.c. motors permanently connected in parallel from a variable-voltage generator combines very close speed control with speed/torque characteristics which reduce the tendency to wheel slip. There are similar advantages in the use of three-phase induction motors fed at variable frequency from a rotary machine, for in this case a slipping axle cannot accelerate above synchronous speed, so that it is virtually coupled to the other driving axles in the same way as if there were side rods.

Both schemes permit the low rates of acceleration with heavy loads which are essential for working the coal and mineral traffic on the steeply-graded Valenciennes-Thionville line, and this characteristic has been decisive in choosing the high proportion of converter locomotives. Monsieur Garreau stated, however, that the 50-cycle a.c. motors adopted in other locomotives for the same project are less susceptible to commutation difficulties at starting than is usual in single-phase machines, and are able to maintain their torque at very low speeds. The S.N.C.F. does not underrate the potentialities of rectifier locomotives, and the five which have been ordered already will permit practical investigation of the effect of harmonics on the supply system.

Monsieur Nouvion dealt with the four types of Valenciennes-Thionville locomotives described in our July 10, 1953, issue. He mentioned that a central cab was a feature common to all designs, namely the Co-Co converter locomotives and the Bo-Bo types with 50-cycle motors or ignitron rectifiers. This feature has simplified wiring by reducing the amount of remote control apparatus and electrical interlocks.

In giving some details of the single-phase/d.c. converter system, he described the characteristics of the special opposed-shunt excitation of the traction motors, which has the effect of weakening the fields progressively and continuously as the generator voltage increases, so that running at practically constant power output is obtained automatically. The Bo-Bo rectifier locomotives have a continuous tractive effort rating of 16 tons, which is greater than that of any French locomotive of the same wheel arrangement yet constructed. They are to have voltage control on the transformer primary, similar to that of the locomotives with 50-cycle motors, but there will be intermediate resistance notches between the 20 transformer tapping steps in order to obtain adequately fine control of

acceleration. In the locomotives with a.c. motors the field and armature inductance at 50 cycles prevents abrupt changes of voltage between notches so that the number of tappings can be lower than is usual in a 16½-cycle control scheme. The drawings and circuit diagrams accompanying Monsieur Nouvion's paper make it a valuable addition to literature on 50-cycle traction, while its presentation just before the discussions of the Sixteenth International Railway Congress on electrification systems was particularly opportune.

British Transport Commission Traffic Receipts

THE general picture of the British Transport Commission receipts for Period No. 4, the four weeks ended April 25, is similar to that presented by the preceding four weeks. If the 10 per cent increase in freight rates had not taken place on March 1 the figures for the traffic affected would have been below those of last year, and it seems that the traffic offering must be on a lower level than in 1953. The aggregate figures for passenger shipping continue to approach those for last year but the increase for the period under review is perhaps rather less than might have been anticipated. No division of figures between the various shipping services is available but it seems possible that at holiday periods such as Easter, air traffic to the Continent may be affecting the short sea routes.

	Four weeks to April 25		Incr. or decr.	Aggregate for 16 weeks		Incr. or decr.
	1954	1953		1954	1953	
	£000	£000	£000	£000	£000	£000
Passengers—						
British Railways	9,091	8,695	+ 396	29,818	28,651	+ 1,167
London Transport—						
Railways	1,415	1,341	+ 74	5,734	5,451	+ 283
Road Services	3,926	3,688	+ 238	15,163	14,350	+ 813
Provincial & Scottish Buses	3,718	3,499	+ 219	13,503	13,049	+ 454
Ships	330	323	+ 7	860	870	- 10
Total passengers	18,480	17,546	+ 934	65,078	62,371	+ 2,707
Freight, parcels & mails—						
British Railways—						
Merchandise & livestock	8,598	8,048	+ 550	34,817	33,822	+ 995
Minerals	3,608	3,520	+ 88	14,340	14,285	+ 55
Coal & coke	8,674	8,196	+ 478	35,756	34,737	+ 1,019
Parcels, etc., by passenger train	3,138	2,917	+ 221	11,783	11,410	+ 373
Total British Railways	24,018	22,681	+ 1,337	96,696	94,254	+ 2,442
British Railways C. & D., etc.	950	866	+ 84	3,712	3,579	+ 133
Others*	6,120	6,293	- 173	25,384	25,424	- 40
Total freight, parcels and mails	31,088	29,840	+ 1,248	125,792	123,257	+ 2,535
TOTAL	49,568	47,386	+ 2,182	190,870	185,628	+ 5,242

* Inland waterways, freight haulage, and ships.

British Railways collection and delivery services show a considerable improvement but the decrease on inland waterways, freight haulage, and ships, bulked under the heading of "others," has now converted the increase for the year into a decrease. This presumably is caused by the withdrawal from service of further transport units destined to be offered for disposal under the terms of the 1953 Transport Act. Provincial and Scottish bus undertakings show a great improvement and compare very favourably with London Transport road services, which, in turn, did well in this period. The improvement in parcels receipts is encouraging, but mineral traffic continues to show only a slight increase over the corresponding figure for 1953.

London Transport railways show results very similar to those for Period No. 3 and there is no clear sign that cheap evening fares have, as yet, produced any marked effect on receipts.

The position now is that decreases compared with the previous year are shown only by passenger shipping

services and by "others." The aggregate shipping figures are showing signs of improvement and if the present trend is continued should show an increase over 1953 before very long, but receipts from "others," incorporating as they do receipts from road freight haulage, are bound to decline with consequent effects on the comparison of aggregate receipts with those of last year.

PERCENTAGE VARIATION 1954 COMPARED WITH 1953

	Four weeks to April 25	16 weeks to April 25
British Railways—		
Passengers	+ 4.5	+ 4.0
Parcels	+ 7.5	+ 3.2
Merchandise & livestock	+ 6.8	+ 2.9
Minerals	+ 2.5	+ 0.3
Coal & coke	+ 5.8	+ 2.9
Total	+ 5.5	+ 2.9
C. & D. services	+ 9.7	+ 3.7
Ships (passengers)	+ 2.1	- 2.3
British Road Services, Inland Waterways and Ships (cargo)		
	- 2.7	- 0.1
Road Passenger Transport, Provincial & Scottish	+ 6.2	+ 3.4
London Transport—		
Railways	+ 5.5	+ 5.1
Road Services	+ 6.4	+ 5.6
Total	+ 6.2	+ 5.5
Aggregate	+ 4.6	+ 2.8

Indian Railways in 1952-53

THE report for 1952-53 of the Government of India Railway Board, which we have received from the Chairman, Mr. F. C. Badhwar, shows that during the year ended March 31, 1953, the aggregate gross earnings of all railways in India were Rs. 272.31 crores, exclusive of freight charges on the carriage of railway stores, fuel, and other materials, which since April 1, 1952, had been excluded from the accounts. The corresponding figure for 1951-52 was Rs 294.14 crores, but it included Rs 16.31 crores for such charges, so that the comparable decrease was only Rs 5.52 crores or roughly 2 per cent. This fall in gross earnings was due mainly to lower passenger receipts, goods earnings, though shown as 6.6 per cent lower than in the previous year, were 4.5 per cent higher, calculated on the same basis. (Rs. 1 crore = £750,000.)

The gross earnings of the Government Railways totalled Rs 270.56 crores, and after meeting depreciation but not interest charges, the net revenue for 1952-53 amounted to Rs 47.18 crores. Of this sum, Rs 33.99 crores were payable as dividend at 4 per cent on capital invested in the railways out of general revenues, leaving a balance of Rs 13.19 crores available for contributions (a) to the development fund, Rs 12.00 crores, and (b) to the revenue reserve fund, Rs 1.19 crores.

Some of the principal statistics of working all the railways in India in this and the preceding year are given below:—

	1951-52	1952-53	Percentage variation
Passengers carried (millions)	1,232.10	1,184.41	- 3.9
Passenger-miles (millions)	39,550.8*	36,035.6	- 8.9
Passenger earnings (crores)	111.42	101.87	- 8.6
Average passenger journey (miles)	32.1	30.4	- 5.3
Freight-tons carried (millions)	97.9*	98.4	+ 0.5
Net ton-miles (millions)	29,018.0	28,961.0	- 0.2
Goods earnings (crores)	153.95	143.80†	- 6.6
Average miles a ton of goods was carried	296.5	294.4	- 0.7
Total working expenses (crores)	227.58	209.93†	- 3.36

* Revised figure. † Exclusive of freight charges on carriage of railway stores, etc.

On Government Railways the percentage passenger decrease was similar, and the decline occurred in all classes of traffic except air-conditioned, which showed an increase of 31 per cent in passenger-miles; 94.8 per cent of all passenger-miles were third class. Revenue-earning goods

traffic increased by 3 per cent over that of the previous year.

Government Railways worked 3.51 million more train-miles than in 1951-52, an increase of 1.97 per cent. The net ton-mileage per wagon-day fell from 463* to 452. Although total working expenses were Rs 7.65 crores lower than in 1951-52, it must be remembered that the figure for the latter year included Rs 15.01 crores for charges on railway stores. On the same basis of computation for both years, there was an increase in total working expenses of about 3.2 per cent, accounted for by increased cost of labour and materials. It is noteworthy that during the year under review the regrouping of the railways was completed with the inauguration of the Eastern, North Eastern, and Northern Railways on May 14, 1952.

Also in the course of that year the Government of India published its first Five Year Plan. In it the railways were allowed Rs 400 crores spread in increasing measure over the period, but they were expected to find Rs 320 crores out of that sum from their surpluses and other resources, the remaining Rs 80 crores being contributed from the central revenues. The Rs 400 crores are being devoted mainly to rehabilitation with a view to meeting a 10 per cent increase in traffic by March, 1956.

Two private railways were acquired by the State during the year, the Tezpur-Balipara 20-mile light railway in Assam, and the Tinnevely-Tiruchendur 38-mile metre-gauge line owned by a District Board in the State of Madras. Moreover, it was decided to purchase the Barsi Light Railway as from January 1, 1954.

On the recommendation of the Dearness Allowance Committee, the Government of India ruled that a portion of the dearness allowance be absorbed into the pay of the staff as from April 1, 1953. This affected railway finances in subsequent years. It was further decided that in place of the division of the railways into three classes according to their earnings, there should in future be only (a) Government Railways and (b) Non-government railways. At the end of the year 15 small railways operating only 756 miles of narrow-gauge lines were worked by non-government agencies. Three pages of the annual report on Indian railways are devoted to a detailed tabulation of the damage caused by floods and cyclones during 1952-53; the most extensive and costly was in Assam. The Indian Railway Centenary Exhibition, previously described in these pages, was opened on March 7, 1953.

Four new or restored lines were completed and opened for traffic in the year ended March 31, 1953, namely, (1) Mukerian-Pathankot, 26 miles; (2) Bijnor-Chandpur Siau, 21 miles, both extensions of the Northern Railway; (3) Suler-Singanallur, 9 miles, Southern Railway; and (4) Gandhidham-Deesa, 170 miles, the major portion of the Kandla-Deesa Railway, Western Railway. No. 1 provides a new broad-gauge route from India to the borders of Kashmir, and entailed the building of a big bridge over the Chakki River. In addition, there were under construction 243 miles of new railway and 400 miles of restored lines dismantled during the war. The most important was the new Quilon-Ernakulam link, 96 miles in southern India. No lines were closed during the year, but surveys for a further 547 miles of new lines were sanctioned.

The numbers of new standard locomotives ordered and placed in service during 1952-53 were:—

	5 ft. 6 in. gauge	Metre gauge	Narrow gauge
Ordered	140	70	15
Placed in service	54	136	18

Of the 140 broad-gauge engines, 50 were ordered from the Chittaranjan Locomotive Works, and 90, including 10 diesel shunting engines, from abroad; the other 130 were all "WG" class goods engines. 50 "YP" class metre-gauge passenger engines were ordered from the Tata Locomotive & Engineering Company, and the remaining 20 locomotives of that gauge and the 15 narrow-gauge engines

* Revised figure

were ordered from overseas. New orders were also placed (a) on Tatas for 71 boilers, and (b) on the Textile Machinery Corporation, of Calcutta, for 10 "MAWD" class boilers. Coaching stock in service was augmented by 585 broad- and 319 metre-gauge vehicles. These included 16 multiple-unit suburban and 45 integral-design broad-gauge coaches, as well as 43 metre-gauge coaches, all of which were imported; also 21 air-conditioned were built in railway shops. Orders were placed with Hindustan Aircraft Limited for 150 broad-gauge all-steel third-class coaches, and with overseas firms for 24 multiple-unit and 200 other coaches, and 12 railcars and trailers. In addition, the wagon stock in service had added to it 14,438 new vehicles of various types and gauges, and a further 10,862 were ordered, 4,272 of them from abroad.

In September, 1952, the Research Section of the Central Standards Office was reorganised under a Research Directorate of the Railway Board. Included in its activities were investigations by a soil-mechanics and building-research wing, and fresh tests with a rolling-load fatigue testing machine, and with dynamometer and oscillograph cars. Of the 11,118,942 tons of coal consumed by Indian rail-

ways during the year, 2,673,877 tons came from railway collieries. The total number of employees of all grades on the Government Railways was about 926,000. On January 31, 1952, the Railway Staff College at Baroda was officially opened by the Minister for Railways; there were also 31 Traffic Training Schools and a number of Workshops Technical Schools in being.

There were three major accidents during 1952-53. On May 18, 1952, a mixed and a goods train collided head-on near Bikaner; 45 persons were killed and 67 injured. Both trains were allowed to enter the block-section concerned without permission from the stations in advance. On September 28, 1952, the engine and first five coaches of the up Allahabad express were derailed near Benaras, three persons being killed and 22 injured; the cause was tampering with the track by unknown persons. On February 26, 1953, the third coach of a Grand Chord passenger train caught fire between Gaya and Kastha stations and was completely destroyed down to floor level. Five persons were killed and 16 injured. The fire was caused by a tin of petrol in the coach, ignition resulting from the throwing of a lighted match by a passenger.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Wagon Bogie Design

May 4

SIR,—The article on developments in wagon bogie design on page 466 of your April 23 issue spotlights the modern cast-steel bogie and shows a brake lever bracket riveted to the bolster. The correction of wear which occurs in the holes from which these levers are suspended constitutes a problem of subsequent maintenance warranting further consideration at the design stage.

It is significant that manufacturers of this type of bogie in this country have used our Walter patent hardened steel split bushes for such applications where bogies have been for their own internal use. Thus they provide for ease of replacement as new Walter bushes can be fitted with the same degree of tightness as when fitted to loose brackets and are therefore particularly suitable for relatively inaccessible holes subject to wear.

Yours faithfully,

L. B. NORRISH, M.I.L.O.C.E.,
Technical Representative

Self-Priming Pump & Engineering Co. Ltd.,
Parliament Mansions, Victoria Street,
London, S.W.1

A Check to U.S.A. Railway Progress

May 8

SIR,—With reference to the article in your May 7 issue, in March, Dr. J. H. Parmelee, Consulting Economist, Association of American Railroads, published a study entitled "The Railway Outlook," which throws further light on the U.S.A. position. After examining current trends with the aid of the statistics used in your article, he proceeded to consider railway traffic and revenue prospects for the rest of 1954, preparatory to taking a long-term view. His analysis stresses the point that the first seven months of 1954 compare with an encouraging period of 1953, when wagon loadings, ton-miles, freight revenue, total revenue and net income all increased; in the last five months of 1953, these items all decreased.

Dr. Parmelee thinks that freight traffic is likely to run below that of 1953 until June or July. His guess on ton-miles would be a 10 per cent decrease for the first half of this year and in the second half a level closer to, or even exceeding, the 1953 level. For passenger traffic the decrease may be held to 5 per cent, with prospects of a slight upturn towards the end of the year. The railways, he con-

cludes, can hardly hope to earn this year so great a net income as in 1953.

For the long-term outlook, Dr. Parmelee believes that the American genius for research and mechanised production will expand the national economy and increase the demand for transport. The railways handle one-half of all commercial freight and passenger traffic and are well equipped for an intense struggle to retain a satisfactory share of competitive business. From 1946 to 1953 they spent more than a thousand million dollars a year on betterments to their plant and worked traffic with increasing efficiency.

It is interesting to read that, apart from technological progress, Dr. Parmelee can praise the development in the spirit of service shown by the railways to traders and travellers. In return he urges that the railways are entitled to fair treatment from the Government: "such treatment is all they ask or need; they will do the rest."

Yours faithfully,

R. BELL

Frogna, N.W.3

Praise for British Railways

May 10

SIR,—The new diesel trains of British Railways are a matter for congratulation. The high power-weight ratio achieved and the seating arrangements are especially praiseworthy; my only criticism is that the motormen might be troubled by too close-up view of the track afforded by the deep windows in the driving compartment.

Credit is also due for the excellent arrangement of the "Popular Carriage" Exhibition at Euston, which shows that whatever the defects of organisation in other respects, the British Transport Commission are expert museum curators. The high standard of British Railways pictorial and cartographic posters is still being maintained. It is to be hoped that some of these can be displayed in other countries. Surely a poster exchange scheme between European railways, embracing those more artistic designs not specifically produced to attract foreign travel, would cost little, and could enable every station in Western Europe to have about 10 per cent of these foreign posters which, in any country, have a romance not associated with home productions, however good?

Yours faithfully,

JOHN RODGERS

"The Cottage," 132, Worrin Road, Shenfield, Essex

THE SCRAP HEAP

Castle Bromwich Belle

Visitors to the Castle Bromwich section of the British Industries Fair may receive the fleeting impression of a new luxury service to the Midlands when they see a row of Pullmans and a "Devon Belle" observation car outside the fair buildings. The cars, however, are stabled on a siding in the grounds to form the Pullman Club, a venture begun at last year's exhibition to supplement existing catering facilities and provide members and their guests with a rendezvous combining the amenities of a lounge and restaurant.

The Real Railway King

We had, a few days ago, the pleasure of witnessing, in the Great Hall in the Euston Square terminus of the London and North-western Railway, the inauguration of the statue of George Stephenson, the real Railway King, the originator of the locomotive, the thinker-out and worker-out of the whole detail of the railway system, from the grand discovery of the blast-pipe to the invention of the steam-whistle. The work is by Mr. E. H. Baily, R.A.; and it exhibits, in a marble statue about eight feet high, a happy medium between the colossal and the idea of a man elevated above the average of humanity. The burly form and nobly intellectual countenance of the great railway hero, has been most successfully represented by Mr. Baily, partly from the picture by Lucas, and partly from the sculptor's personal recollections of the great man, who rose from the lowest drudgery of the coal-pit to invent the magnificent principle of the blast-pipe, which, by making steam create speed, makes speed create



Observation and other Pullman cars of the Southern Region "Devon Belle" used as the Pullman Club at the B.I.F., Castle Bromwich

steam, and vice versa; who threw a railway over the Chat Moss—a feat pronounced the triumph of engineering; a man who has designed and executed in all their details 5,000 miles of railway, and on whose lines you may travel from London to the Border; and through whose hands have passed, and usefully passed, more score of millions of money than has yet been estimated.—From "Chambers Journal," May 27, 1854.

[The statue is believed to have been purchased out of over 3,000 two-shilling subscriptions by working men and contributions from friends. The words "real Railway King" may refer to the railway promoter, George Hudson, generally known at that time as The Railway King. The statue is still in the Great Hall at Euston.—ED., R.G.]

Preservation of a Fell Locomotive

With the eventual opening of the new line of the New Zealand Government Railways through the Rimutaka Tunnel, referred to in our May 7 issue, and abandonment of the famous Rimutaka incline, there will be presumably no further work for the tank locomotives which have rendered many years good service in working trains up the incline on the Fell system. This method of working consists basically in the exercise in the locomotive of a spring-loaded grip on both sides of a third rail, so as to secure adhesion. It has been suggested in the New Zealand Press that one of these engines used on the Rimutaka incline be shipped to England and exhibited in the Science Museum at South Kensington.

Pullman into B.T.C.

(The B.T.C. is negotiating for Pullman Car Company shares)

Good railwaymen, active or "ex," like me,
Must be swelling just now quite wisely,
Though the latest tidings may not have pleased
George Mortimer Pullman, Esquire
(deceased).

Why, even old Gilbert the Terrible
May prove to be far less intractable
And curb his irascible urge to cuss
When at last the Pullmans belong to us.

Though only a simple old chap, who feels
Half abashed by these palaces on wheels,
I was, frankly, thrilled to the very marrow
At having a share of the "Golden Arrow."

But premature visions of ecstasy
Vamoosed when the hard-hearted
B.T.C.

Inflexibly stated their fell intent
To make us still fork out the supplement!

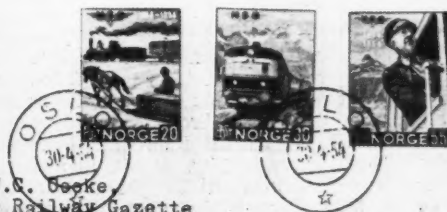
A. B.

Norwegian Railway Centenary Stamps

FIRST DAY COVER



B.W.S. Cooke,
The Railway Gazette
33, Tothill Street
LONDON SW 1
England



N O R G E S S T A T S B A N E R



Envelope addressed to the Editor by the General Manager of the Norwegian State Railways. It bears the stamps of three denominations, commemorating the Norwegian railway centenary, mentioned in our April 9 issue

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Shortage of Wagons

A deputation from the Natal Chamber of Industries is reported to have sought an interview with the Minister of Transport on the subject of rail embargoes and wagon shortages in view of the greater demand for wagons by the sugar industry, which may aggravate the difficulties of coal movement.

RHODESIA

Freight Rate for Copper

A new railway freight rate of 1.152d. a ton mile for copper export traffic on the Rhodesia Railways has been agreed by the railway and the two Northern Rhodesian copper mining groups. Imports to the copper companies through the port of Beira will be carried at 10 per cent less than the public rate for traffic on this route.

JAPAN

Suita Marshalling Yard

Suita Marshalling Yard, some ten km. north of Osaka, is the largest in Japan, with a total area of 760,000 sq. m. and an aggregate length of yard tracks of approximately 125 km. The number of trains handled here is 257, 127 in and 130 out. The number of wagons handled is 5,868 a day on an average. Three humps are provided and there are ten shunting locomotives. Ten wagon retarders were installed in 1952 in the up hump.

VICTORIA

Wheat Trains Diesel Hauled

Diesel locomotives, operating in single and multiple units, have accelerated movement of the wheat crop. In the first six weeks of the season 23,205 wagon loads were moved from the producing areas. Although the season was later this year and loading was slowed down to the unloading rate of wagons, because of slower buying for export, movement of wheat was 1,000,000 bushels greater than for the corresponding six weeks of last year, when the wagon load figure was 21,767 (16,332,000 bushels).

Diesel-electric locomotives were used to transport all bulk wheat from Korong Vale and Donald to Dunolly and from Bendigo and Seymour to Melbourne and Geelong. Diesels, as well as steam locomotives, also brought large quantities of bulk wheat from the North-West to the storage centre at Dunolly.

In the first instance, main-line diesel locomotives were used as single units to haul 900-ton loads of bulk wheat on each of four trips daily. Later, diesel locomotives worked the wheat trains in pairs,

and on each of four trips daily they brought into Dunolly 59 wagons of wheat weighing 1,800 tons. Between Donald and Dunolly multiple-operated diesel main-line locomotives hauled 1,500-ton loads on each of three trips daily.

CANADA

Lay-Off of C.N.R. Staff

The drop in traffic is reported to have necessitated a lay-off of Canadian National Railways staff, at the C.N.R. shops at Point St. Charles, Montreal, at Winnipeg, and elsewhere. It is stated that there had been a drop of 50,000 in freight car loadings during the first quarter of the year.

UNITED STATES

Wisconsin Central Reorganisation

A complex scheme of reorganisation has resulted in the transfer from March 9, 1954, of the Wisconsin Central Railway Company, a Wisconsin corporation which has been in receivership for the past 22 years, to a new Minnesota corporation called the Wisconsin Central Railroad Company. The system, with a route mileage of 906, extends from Chicago to Duluth, Lake Superior, with branches from Owen to St. Paul and Minneapolis, Marshfield to Ashland and Bessemer (also on Lake Superior), and various shorter branches.

Hitherto the Wisconsin Central has been operated as a part of the Minneapolis, St. Paul & Sault Ste. Marie Railroad (generally known as the Soo Lines), and has provided the M. St. P. & S.S.M. with its direct route between Winnipeg and Chicago. This control will continue, and the new Wisconsin Central Railroad therefore is appointing no operating officers of its own.

Passenger Conveyor Belt in Jersey City

What is believed to be the first commercial passenger conveyor belt in the world will soon be in operation between the stations of the Erie Railroad and the Hudson & Manhattan Railroad (Hudson Tube) in Jersey City. It will be capable of handling 10,400 passengers an hour through the tunnel between the stations. It is being built for the Hudson & Manhattan Railroad by the Goodyear Tire & Rubber Company and the Stephens-Adamson Manufacturing Company. General Electric Company engineers, working in conjunction with Goodyear and Stephens-Adamson, developed the electrical system. The equipment includes a fan-cooled motor, a combination reversing starter (fusible type), and a thruster brake.

The conveyor, 227 ft. long, will use a six-ply rubber and fabric belt 5½ ft. wide and ¾ in. thick. It runs at 1½

m.p.h. For 127 ft. of its length, the belt will carry passengers on a 1 in 10 gradient. Handrails will move at the same speed as the belt and passengers will be able to step on and off it as if it were an escalator.

The General Electric reversing starter and totally-enclosed 1,200 r.p.m. fan-cooled motor are both rated at 20 h.p., 220-volts, three-phase, 60 cycles. The thruster brake is rated at 600 lb.-ft. continuous and 800 lb.-ft. intermittent.

FRANCE

New Signalbox at Strasbourg

To control all movements to the north of Strasbourg-Ville Station, a new all-electric signalbox has been put in operation. The box, which replaces one mechanically operated box and six ground frames, controls 400 route variations; these are operated by 100 levers, each with four working positions. The lever frame measures only 21 ft. 7 in. by 5 ft. 3 in.

The interior equipment required the use of 134 miles of wire, the fitting of 1,322 relays and 31,500 terminals. Outside apparatus required in all some 65 miles of cable (15 miles recently installed), 250 relays, the connection of 10,000 terminals, the installation of 22 sets of colour-light signals and 61 ground-level shunting signals, and 120 point motors.

WESTERN GERMANY

Lighting Mast on Tool Van

Engineers of the Federal Railway at Krefeld have designed a simple device for lighting working sites. It is a mast which can be raised by compressed air taken from the main air pipe. The mast consists of a pipe 110 mm. in diameter, serving as a cylinder for a sleeve piston; the piston moves a second pipe which acts as a piston rod and carries, at the top, a reflector with four 200-W. glow lamps. The piston movement is controlled by springs which absorb the shocks occasioned by the termination of the upwards and downwards movement. The raised mast is held by a sleeve near the van roof and is thus fairly rigidly fixed. The mast can be fixed in the raised position by a simple locking ring so that the air pressure need not be maintained. The mast is lowered, easily and free from shocks, by loosening the locking ring and releasing the compressed air.

The electric feeder cable is freely suspended outside the mast and follows the movement through a weighted pulley. The lamps can be raised to a height of 7.25 m. above rail level. If three telescope pipes are used, this height can be increased to 11 m. A hinged ladder, normally fixed in the vertical position, provides easy access to the lamps. Experience has been highly satisfactory.

*Sixteenth International Railway Congress***Permanent Way Maintenance***Programming, detecting-recording, and mechanisation*

TWO only, the German and Austrian Federal Railways, replied out of eight administrations in Central and Eastern Europe consulted about question No. 1, on this subject, to be considered by the forthcoming International Railway Congress in London; five of the remaining six railways are behind the Iron Curtain. The replies from Germany and Austria have been reported on by Dr. Gerhard Schramm, of the German Federal Railway.

The German system, of 71,500 track-km., is divided into 16 divisional managements (Bundesbahndirektionen), the extent of track in each of which varies from 1,900 to 8,500 km. These are subdivided into 173 operating areas, 4-17 to a division. Track maintenance is by 1,181 "track districts" (corresponding to sub-inspectors' lengths), and they are generally responsible also for signalling, telecommunications, bridges, formation, and buildings. Where work is specially heavy, however, there are special signalling and telecommunications districts, which are outside the scope of the report.

Besides the 1,181 track districts, there are 73 mobile works trains, each with a staff of 80 and self-contained establishments. Thus in reality there are 1,254 units directly responsible for permanent-way work. Each "track district" may normally have either 20 km. of double main line, 30 km. of single main line, 25 km. of double secondary line, or 40 km. of single secondary line.

Track-District Organisation

There are two types of track district organisation, (a) exclusively for maintenance of track and structures, and (b) wherein the staff forms a pool on which other departments can draw in case of need: (b) is the type in force in Austria.

The volume of maintenance work fluctuates seasonally. The major works of the annual programme are generally carried out between March and August, routine maintenance only being done in autumn and winter; freight traffic is heavier in autumn. The tendency is, therefore, to retain only a small core of staff all the year round, and to add to it with temporary labour when required. Alternatively, major works in summer may be done by contract, and, in fact, some 20-25 per cent of all trackwork is done by contractors. Some of the additional work, however, is done by the works trains, especially where labour is scarce.

Level crossings are manned by permanent staff, but track districts provide reliefs whenever necessary. According to regulations, lengths must be inspected six times a week on main lines, and three times on secondary lines, but

the administration is endeavouring to get the figures reduced to twice and once, respectively. About 15,000 men are employed on track inspection. Men travel to and from work by bicycle, motor trolley, or train according to distance; for major works passenger trains are stopped as required to set down and take up men. Wages are paid as from time of arrival at the work, journey-time being covered by a small allowance.

Mechanisation

Besides the smaller machines in use on the German railways before the last war, there are now 16 ballast-cleaning, and 34 tamping machines, as well as equipment for laying concrete sleepers, cranes and a variety of smaller machines. Financial stringency forbids the replacement of wooden sleepers in sufficient numbers, and so they have to be retained as long as possible by dowelling and plugging; special dowelling gangs with planing machines are employed. Concrete sleepers have been in service for about 10 years, and have proved so reliable and economical that they have been standardised, especially in connection with long welded rails. As these concrete sleepers weigh 230 kg., mechanical handling is essential, and enables more than one km. to be laid in a day.

Mechanisation necessitates changes in organisation, however, and each big machine has a gang attached to it, housed in vans. These machines are directly controlled by regions and areas. For larger jobs labour is concentrated from several track districts, as there are normally few men in each. Area gangs are employed and controlled by areas. Large numbers of motor trolleys are used as staff transport, and road vehicles are also useful in some cases. When full mechanisation has been achieved the work of the track district will be reduced considerably, and it will then be possible to extend its jurisdiction by about 20-25 per cent.

Distribution of Track and Equipment

In order to lengthen the average overall life of track material, a single class of heavy material is purchased and laid on lines carrying heavy, fast and frequent traffic. The material replaced is relegated to less important lines. Taking into account the average useful life of materials, German track and equipment are divided into three classes according to the importance, weight, and frequency of the traffic carried. In this way, first class material is laid on 45 per cent of the track-mileage of the system, second class on 35.4 per cent, and third class on 19.6 per cent.

Maintenance work is planned with the aid of (a) track-recording vans, (b) a comprehensive graphic office record, (c) district foremen's reports, and (d) instructions from the Chief Engineer or Regional Engineer. Complete simultaneous renewal of ballast, sleepers, and rails is considered more economical than part or piecemeal renewal or replacement.

The now-standardised concrete sleepers are, as already mentioned, laid by special machines, and usually it is possible to resort to single-line working by inserting one or two crossovers—even on electrified sections carrying about 200 trains in both directions daily—and by cancelling or diverting goods trains and replacing passenger by bus services. If the line cannot be closed for the duration of the work, but a five-hour occupation is possible, mechanical track-laying is economical; if less time but more than three hours is available, complete sections of even curved track are assembled in a near-by yard and conveyed to the work on special lorries. By this method three 60-m. lengths of concrete-sleeper track can be laid in the three hours.

Wooden sleepers are generally laid by hand after lineside distribution; mechanical laying on a prepared length of ballast is not usually practical because the thickness of the sleepers varies. Laying complete sections of wooden-sleeper track by the method just described for concrete sleepers is being considered, but has so far been adopted only on a small scale. Although no new metal sleepers have been purchased by the German railways since 1938, some 44 per cent of all their track is still laid with them, and their replacement and re-use in less important lines accounts for 25 per cent of all sleeper-laying today. Meanwhile, great importance is attached to the reconditioning of both wooden and metal sleepers. All other relaying work is now done as far as possible mechanically.

Ballast Cleaning and Tamping

It is estimated that a ballast-cleaning machine does the work of 80 men. New ballast is railed in and discharged from hopper wagons, is spread by caterpillar scrapers, and rammed by ballast cylinders or Vibromax rammers. The Krupp mechanical tamper was previously used, but the Matisa mobile type has now proved more economical for most laying and repair work, but its disadvantage is that it occupies a track closed to traffic. Its use is therefore restricted to sections where at least five 1-hr. occupations a day are obtainable. Jackson and Vibromax tamping machines are also widely used. Measured shovel packing

has been practised for the past 10 years, but it requires a well-settled ballast, and cannot be used for track renewal and replacement.

The use of cranes for track laying is being extended as it is extremely economical. The special track-laying vehicle introduced 20 years ago for conveying completely-assembled track from the shops and laying it at site has proved too elaborate and its availability is too restricted; no others are to be built. Long welded rails are drawn off the ends of trains on specially-inclined ramps and coach-screws are turned by electric tools, usually powered by diesel-generator sets. Track laying is carried out by the well-trained and -organised work-train gangs.

Safety Precautions

All occupied track must be protected by stop signals and a telephone line must be laid to the work site. Where work affects the ballast, a speed restriction of 25 m.p.h. is imposed, otherwise a 36-m.p.h. restriction is allowed wherever possible. When noisy mech-

anical plant is working, the labour is warned of approaching trains by additional look-outs and compressed-air sirens. All work must be stopped during the passage of a train on an adjacent track.

On the German and Austrian railways only the normal berms are available for men moving on foot, or in some cases on bicycles. Tools and machinery usually have to be transported by parallel roads, which seldom belong to the railways. Railway land-widths are generally limited and do not permit of American-type side paths suitable for machinery being made.

Economic Considerations

The savings effected by mechanisation in maintenance are an important economic consideration. Comparing the German maintenance programmes carried out with and without machines, it is estimated that the former effects an overall average saving of about 8 per cent. The saving in maintenance costs resulting from the use of concrete sleepers, however, is stated to be

20 per cent. The effect of density of traffic on the cost of maintenance work is shown in the report by a table giving the percentage increases in the number of days required to complete a job resulting from different numbers of daily trains. This increase varies uniformly between a 5 per cent increase for 5 to 10 trains to 35 per cent for 76 to 90 trains a day. Allowances are paid to men working for more than 3 hr. outside their own track-districts.

The report concludes with an appendix giving full technical details of the permanent way used on the two Federal Railway systems, mainly in tabular form and partly as replies to queries. Both administrations use the S 49 rail as standard; it weighs 108 lb. per yd. The German railways also use a 142-lb. rail in tunnels; it is laid in continuous welded lengths throughout each tunnel. In Germany, long rails are electrically butt welded, if possible to lengths up to 120 m. in the open, if they are new. Recovered rails are welded into 30-m. and 45-m. lengths. The Austrians weld to 30 m. only.

Remote Control of Points and Signals: Design of Electric Point Mechanisms

Economic and other aspects of centralised and other forms of remote control; characteristics of electric point machines; trailability

THE report on Question 6 to be discussed by the International Railway Congress commencing next week, prepared by Mr. J. Nogués, Deputy Manager in charge of signalling on the Spanish National Railways, covers Spain, France, Belgium, Portugal (and their associated colonial territories), Greece, Italy, Luxembourg, the Netherlands, Switzerland, Syria, and Turkey. The replies from other groups of railways were discussed in our issues of February 26 and April 9. The questions were sent to 60 managements, of whom 30 replied. The number of remote control installations in these territories is very small, but there is a tendency to instal more. One C.T.C. installation was put into use in Spain in 1953, covering 30 route-miles, and a Belgian colonial management has decided to apply such equipment to a 227-mile single-line route with 37 stations and 74 actual locations. About one-third of this interesting work is under construction.

In France there is the important installation on double track with reversible working between Blaisy and Dijon, controlled from the latter. The French National Railways consider that, short of special circumstances, which obtain in this instance, there is no justification for installing C.T.C. to obtain staff reductions only, as that can be done by automatic signalling and effecting certain other changes.

There might, however, be certain special cases where traffic has reached saturation point and better regulation of it and use of the line could be obtained by C.T.C.

The Italian lines point out that C.T.C. on double track offers the greatest attraction when it is a question of applying reversible working fairly extensively. They have a short single-line bottleneck so operated and some double line serving junctions on the line running round Bologna, but there it is more a matter of remote control than actual C.T.C.

Remote Control in France

Apart from full C.T.C. there are many examples of remote control which are of great interest. In France this has been applied to combine in one signalbox or operating location the control of an installation extending over a considerable area. This arrangement reduces greatly the expense for cables as compared with the older direct form of power signalling circuits, at the same time saving staff. The new box at Montereau controls 119 points and 340 routes and has replaced five mechanical boxes. Its area is divided into four zones; one is controlled directly and the remainder by remote impulse control. An example of a junction so dealt with from an adjoining station is that at Soignies, Belgium.

The Italian installation at Bologna

covers 10 junctions. Switzerland has applied remote control to crossovers in the middle of long tunnels, Gothard, Simplon, and so on, in conjunction with track circuiting and axle counters. There is some variation between the countries as to the number of indications given on the control panels but in all cases the operator controls only the absolute stop signals, and no permissive automatic ones. No subsidiary signals are provided for giving permission to pass a signal at danger.

The method of transmitting controls and return indications differs. In the French installation at Blaisy the line has been divided into three zones to provide greater flexibility and operating speed; each is served by separate line circuits and sets of equipment.

Codes

The capacity of the various systems depends on the nature of the codes to cover a given number of controls and return indications. In France up to 3,600 controls have been provided for. Transmission time, however, places a limit on what can be achieved. The distance to which C.T.C. may be extended is generally considered limited, for reasons of rapidity and flexibility, as when traffic is considerable the time taken to transmit can occasion objectionable delays.

All managements here concerned use d.c. for codes except the Swiss, which uses a.c. Variations of time in a code

and polarity are met with, as in the countries dealt with by the other reporters. Relay chains are used without rotary selectors, but at times these chains perform the same function as such selectors. Most systems employ a normally energised line circuit, giving permanent detection of its state of insulation otherwise only afforded when a code is transmitted.

Both series and parallel connections of the local selecting relays to the line circuit are to be found. No case of carrier current transmission is met with in any territory covered by this report. Interlocking is invariably effected at the outlying locations and points are, as a rule, set up in complete routes, except in Spain where individual working prevails. In some cases no shunting is involved, but in Spain points can be operated locally when required for that purpose, under release from the central apparatus. The control panels comprise push-buttons or thumb switches, with small, variously coloured lamps for indicating purposes. At times, as at Bologna, these panels can be of quite elaborate construction. It is usual to repeat the two extreme positions of the points thereon.

The line circuit generally is formed of two wires, either as an open line or in cable, but on the Blaisy-Dijon line there are, owing to the zoned working, six wires. Protection against lightning and current surges is usually well provided. In France the transmission line is not allowed to exceed five or six miles to protect staff from harmful induced voltages. Except on the Swiss Federal lines no return indication is required before a control takes effect, which in any case cannot occur unless conditions at the outlying locations permit, interlocking being fully provided there.

Storage of Transmission

Storage of both outgoing and incoming transmissions is met with in the various installations, depending on circumstances. The priority to be given to stored signals is a matter for discussion in each case and can be variously provided for. Relays are generally of the improved telephone type, larger and more finely finished, neutral or polar, as required. No difficulty has been experienced as to the time taken in d.c. transmitting, but in the Blaisy installation this is countered by using separate zones as above mentioned.

Points not remotely controlled are generally electrically locked and released from the central apparatus on telephonic request. Both direct electric locking and key control are used with padlocking when necessary. Power for these appliances is provided locally, the remote control portion usually being fed at low voltage d.c. from trickle-charged batteries. Several managements use electric heating of point tongues in severe weather.

Generally speaking, faults in the transmission line are indicated at the central apparatus and certain others,

such as relay or lamp failures, may be. Line faults will affect all locations with the series system or a certain number only with the parallel. When such a breakdown occurs manual working of points is used and signals held at danger passed under special authority. Any local operating panel is disconnected from the remote control and operated as a signalbox under special regulations.

Sometimes the changeover to local working is itself subject to remote control. Passing signals at danger is usually authorised by telephone. With approach locking a change of route can be made if the relevant track section has not become occupied, otherwise an emergency release must be resorted to, proving any signals at danger; details of these arrangements vary considerably.

When a C.T.C. machine proves to be disconnected from outlying locations and the fault cannot be quickly rectified the dispatcher must communicate by any available telephone channel with stations and give the necessary orders.

Train Recording

Most dispatchers themselves make traffic graphs by hand, but in other cases automatic train recorders are used. The description and timetable number of an approaching train are usually transmitted by telephone but more elaborate apparatus is under consideration by some managements, similar to those already applied in Germany. Maintenance of remote control equipment is considered not to give rise to any special difficulties.

The French National Railways, in a detailed reply to Mr. Nogués, stated that by using the plug-in design of equipment, of first class manufacture, little more was needed than inspection at regular intervals and periodical overhaul, the failures hitherto experienced in service being extremely few. The Blaisy-Dijon installation has 20 line-men allotted to it.

Point Operation

Electrical operation of points has been known for many years on the railways concerned in this report before any question of remote control, in the modern sense, arose. In some countries trailable points are used, in others not. When points become specially bolted in addition to a point lock the trailable facility is temporarily annulled.

Locking, working inside or outside the point machine, is used with several forms of detecting; for points taken by fast running trains these are invariably very complete. Special machines are used for points in marshalling yards, able to reverse them in an extremely short time. In the case of a breakdown of the machine or circuit failure hand cranking is resorted to. The power circuit must be disconnected before that is done. Certain prescribed orders have to be issued for trains to run over such points and of course pass the relevant signals at danger.

Some managements use very complete arrangements for preventing any false energisation of a point control circuit that might arise from defective insulation, and so on. The Belgian, French, and Italian methods of providing "cross protection" are especially so, including means of cutting off power when a fault reveals itself. Points are always reversible in the case of an obstacle preventing them from finishing their stroke.

Maintenance of an electric point layout, including all rodding connections and fittings, seems to demand 50-75 hours work annually, varying with the country concerned. In Belgium, Italy, and Portugal points with heeled tongues are invariably made trailable without damage; but in France this feature is limited to marshalling yards. In Spain trailability is always provided at stations where shunting is not controlled by fixed signals or in special circumstances where there is a fear that signals at danger might be passed accidentally.

Unlocking of the closed tongue, whether it is held by mechanism in the machine or on the points themselves, is always brought about by the force exerted on certain parts of the equipment, according to the design adopted by the particular manufacturer, through the wheels acting first on the open tongue.

Some managements have machines without any reversible mechanism, as far as the drive is concerned, so that when trailing occurs the motor itself is not driven backwards. In others, this is the case. When points become trailed the fact is indicated at the signalbox, or centralised control room, and often is accompanied by an alarm bell. No route can be prepared over them until the detection circuit is re-established and the point tongues have been brought once more into agreement with their controlling handle or lever, and so on. Points are not allowed, however, to be run through in the course of ordinary working, although trailable in the manner described, such an event being everywhere regarded as abnormal and to be avoided as much as possible. There is more risk of it where point indicators are used without actual shunt signals.

WESTINGHOUSE EXHIBITS AT THE MECHANICAL HANDLING EXHIBITION.—Among the exhibits by the Westinghouse Brake & Signal Co. Ltd. at the Mechanical Handling Exhibition to be held in June at Olympia, London, W.14, will be a level crossing barrier lifting machine. The barrier arm, which is raised electrically, carries special warning lamps fitted with dioptric lenses to give all-round visibility. The equipment can be operated either individually or automatically; in this a 24 V. a.c. supply is operated from a Westinghouse rectifier set, type RT. 43. On the electrical side a three-phase electric compressor will operate off a single-phase supply through a Westinghouse static-phase converter. Other exhibits will include a comprehensive range of products to demonstrate the adaptability of compressed air for mechanical handling.

Doubling a Main Line of the Central Railway, India

Location and construction work between Budni and Barkhera, for an entirely new and separate down line

THE reasons for and method adopted to secure an easier gradient for trains ascending the Vindhya Ghat on the Itarsi-Bhopal section of the Central Railway north-east main line were briefly outlined in an editorial note in our issue of April 9, and further comment is made on page 538 of this issue.

The distance between Budni, at the foot, and Barkhera, at the top of this ghat, measured along the original single line and now the up track is 12 miles, and there is an intermediate station, Midghat. That line climbs from 1,010 ft. at Budni to 1,538 ft. altitude at Barkhera with a ruling gradient of 1 in 80 uncompensated for curvature.

similar reverse curve. The loop involves first a 3,500 ft. fill averaging 55 ft. in height, then a deep cutting and another bank, and finally Budni tunnel, built as an 820-ft. cut-and-cover. Six possible alignments for the loop were surveyed, and a final decision between the two most suitable was made by inviting tenders for the work on both and accepting the cheaper.

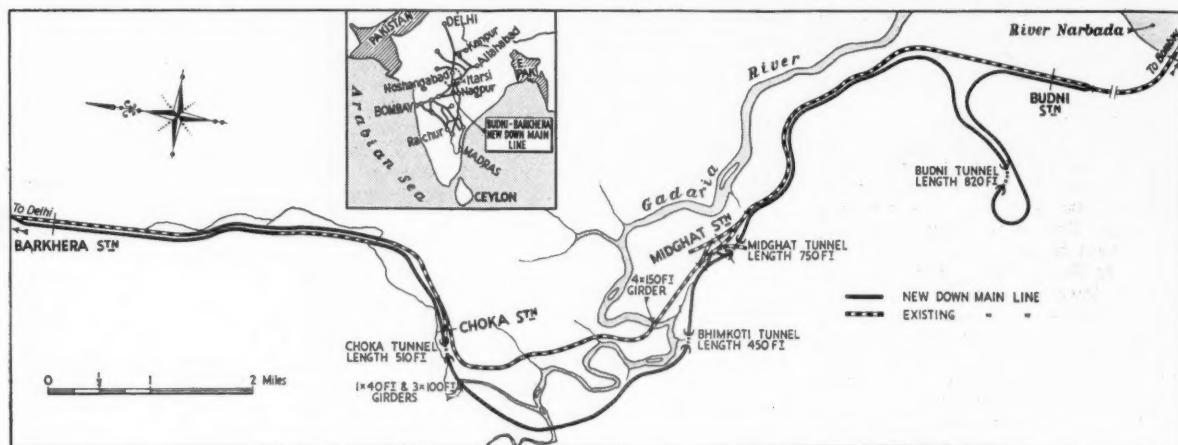
Though the line then traverses steep hillsides above the old line, crossing deep ravines on high banks, the next feature of importance is Midghat tunnel, 750 ft. long, under a runaway catch siding from the up line. After Mid-Ghat station the new line follows a hillside location as opposed to a river

cross-sections were taken, the formation was closely examined, and minor adjustments were made to ensure that the entire formation was on stable ground.

Near Barkhera, the old line was diverted to make room for the new one, and incidentally a series of curves on the former was straightened out to eliminate a speed restriction. Both lines run into both Midghat and Barkhera stations at the same levels in each case.

Construction Notes

In these 16½ miles of new single-line construction 45,800,000 cu. ft. of earth was required for the fills, but the quantity of bedded sandstone and hard boulders excavated to form cuttings was



Old and new alignments of the up and down lines respectively between Budni and Barkhera

To ease the task for ascending trains the new down line, 16.5 miles long, secures a 1 in 125 ruling gradient compensated for curvature by developing its additional 4.5 miles in two separate sections, the station at Midghat separating the two. This station serves both the (old) up line and the new down line, and as they are connected there, it will be possible, in case of emergency, to work any of the four lines converging on that station as a single line, arrangements being provided for this purpose.

A thorough survey of the ghat was made, and alternative alignments with 1 in 125 and 1 in 150 gradients were found to be feasible. The former was eventually selected as being much the cheaper to construct. Detailed examination of the ground along the 1 in 125 (compensated) alignment enabled the most economical, practical, and stable line to be located.

As the accompanying sketch map shows, the new line swings westwards from Budni station, and then doubles back on itself in a 260-deg. spiral loop on a 14½-ch. curve and then on a

flood bed alignment as being cheaper, more stable and less costly to maintain. In this section is Bhimkoti tunnel, 450 ft.

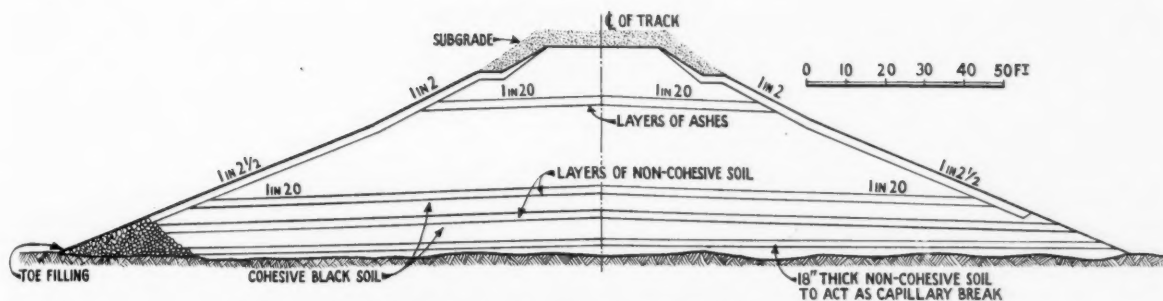
Precise Surveying to Gain Stability

The Gadaria River is crossed by a 65 ft. high bridge consisting of three 100-ft. deck plate-girder spans and one of 40-ft. on concrete piers and "buried" pier-abutments. Thereafter the line clings to a series of cliffs, and the preliminary survey work for this section was of interest, because normal procedure was reversed.

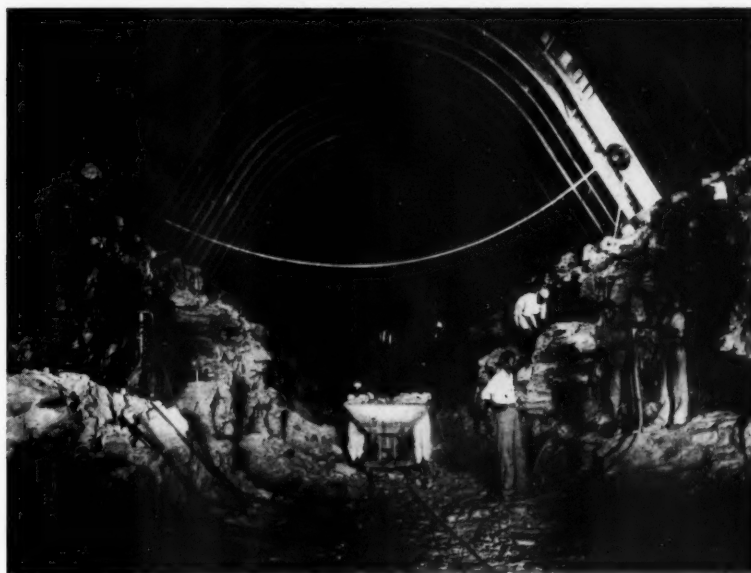
Detail cross-sections of the cliffs were first taken and an approximate formation was plotted on them; then a trace or tentative centre line, keeping well into the cliffs—so that the entire formation based on it was in cutting and on solid rock—was transferred to the contoured plans. The centre line for the final location was next drawn as near to it as was permissible by curves and intermediate straights allowing for full transitions. Finally, this line was set out, fresh

22,400,000 cu. ft., so that large quantities of soil had to be dug from borrow-pits. Unfortunately, the soil available was most unsuitable for 50-60 ft. fills, and the worst or black cotton soil was in the top 6 ft. of the pits, so that deep pits were unavoidable, and even then yielded only yellow calcareous clay.

Consequently the higher embankments were designed and built scientifically as a result of exhaustive laboratory soil tests. Both the black cotton and clay soils have a high capillarity, and so layers of non-cohesive murum were interposed at intervals in the building of the banks. A thick layer of ashes was also laid half-way up each fill, and a 2-ft. layer was placed as a sub-grade to prevent stone ballast from penetrating the clay beneath, when it eventually replaces the present cinder ballast. A typical section of a fill is illustrated. It was also essential to protect the side-slopes from erosion, and, as the deeper borrow-pit soil contained none of the nitrogenous organisms required by plant life, a layer of 6 in. of imported agricul-



Typical cross-section of a 50-ft. embankment in bad soils on the Budni spiral



Benching down the lower half of one of the tunnels

tural earth was provided to promote the growth of protective vegetation.

Mechanised Earthwork

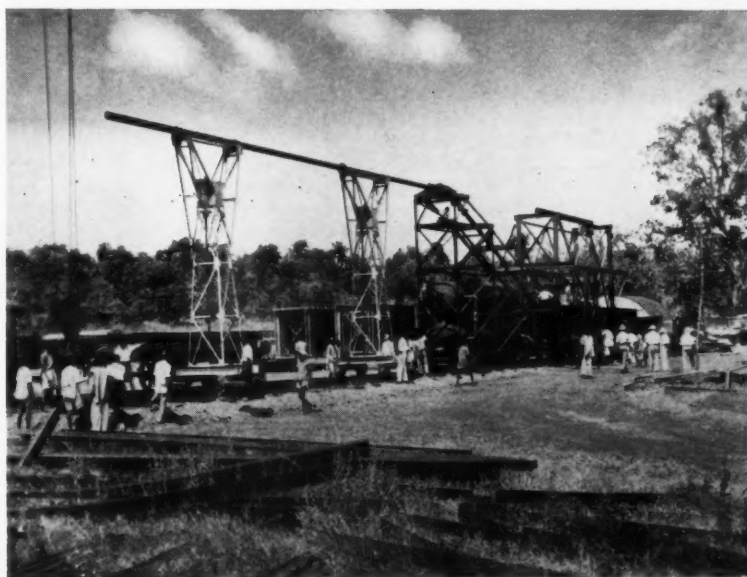
The earthwork was entirely mechanised and worked in three shifts, 20 hr. a day on an average, for 13 days in a fortnight. The plant included 11-cu. yd. scrapers, 6-ton sheepsfoot rollers, 1½-cu. yd. excavators and eight other types of machine. Consolidation was effected with a set of tractor-drawn twin tandem tamping rollers weighted with saturated sand, 6 to 8 passes usually being required. To bring up the moisture content of the soil to optimum, water, under electrically-pumped constant pressure, was systematically sprayed uniformly over each area marked out to be covered in a fixed time. Results within 2 per cent of the optimum moisture content were obtained.

Excavation in Cuttings

In order to lessen the great quantity of rock excavation, a special cross-section was evolved for the cuttings with built-up side drains, which in a cut 40 ft. deep reduced the quantity of excava-

tion by 36 per cent. Rock drilling was done by hand with 45-lb. jack hammers, of which there were 82 on the work. As much of the excavation was close to and above the up line, blasting in many places was confined to periods of occupational blocks, and where no direct damage could be done to the traffic or the line, firing was permitted under a system of flag protection. These restrictions so limited output that in several cuttings in hard shale paving-breakers were used during non-block periods. For the longer leads mucking was done with 4-cu. yd. dumpers, but for those up to 1,000 ft., 2-ft. gauge tramways were used. In the longer cuttings adits were opened up to increase the number of working faces.

Three tunnels were bored, Choka (510 ft.), Bhimkoti (450 ft.), and Midghat (750 ft.); a fourth tunnel was Budni already mentioned. The soils encountered varied from stratified quartzitic sandstone and blocky, seamy material severely broken and faulted in Choka tunnel, to hard red shale in Bhimkoti, and gluconic shale overlaid by soft clay and large boulders in Mid-



Special pneumatic concrete placer with its elaborate equipment. Both were designed and manufactured on the job

ghat tunnel. Consequently, a top pilot heading was used in all cases, and was normally 10-13 ft. high and 8-9 ft. wide, except in certain soft soil where it was much smaller. Dust nuisance was a serious problem, and though wet drilling was successful in Choka, it could not be used elsewhere. Moreover, ventilating equipment was not obtainable, but at Midghat a 75-ft. addit greatly improved conditions. Two to four hours had to be allowed for ventilation of the heading with a weak stream of compressed air. The blasted rock was removed by hand-loading into $\frac{3}{4}$ cu. yd. push tip wagons.

Breakout to Full Section

After the pilot heading was completed throughout, enlargement of the top segment of the tunnel was begun with axial drilling. To ensure the safety

tions began at one end of the tunnel, while the wet-mixing plant and material stock piles were assembled at the other. A substantial steel travelling frame was also designed and fabricated locally to cover a 32 ft. length of tunnel, and can be collapsed and shrunk to pass clear through the lined tunnel. Retraction of the "cloak" plating is effected by push-and-pull jacks; the "cloak" runs on a traveller on a 10 ft. gauge track.

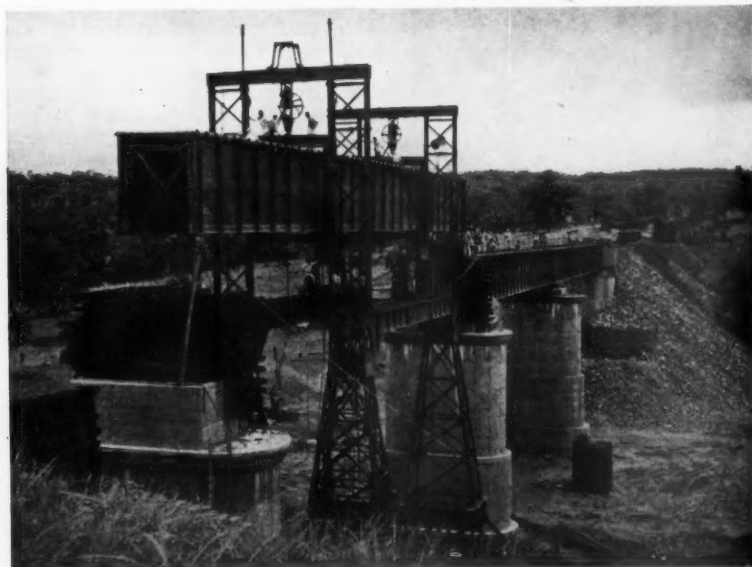
The wet-mixed concrete is conveyed in $\frac{3}{4}$ cu. yd. bottom-dump buckets on flat trucks on a tramway to a lifting-gantry astride the placer. 21 cu. ft. of the mix are unloaded at a time into the placer and emitted through a discharge pipe where required. As concreting proceeds, the discharge end of the pipe becomes buried in the wet concrete, and fresh charges shot out by the placer bubble through the wet-mix

the crown was covered with a 3-ft. layer of rubble, under 3 ft. of soft soil cushioning.

Bridges and Culverts

There are four major bridges, the other three resembling that over the Gadaria in general design, already described. The 100 ft. girders in these bridges are of high-tensile steel and are spaced 7 ft. 6 in. apart. They were launched longitudinally with the aid of an intermediate double-gantry frame shown in the accompanying illustration. Smaller openings were in the form of 40 ft. girder bridges, arches—cast in mass concrete and faced with pre-cast concrete blocks—of from 8 ft. to 40 ft. span, single- and twin-span box culverts, and culverts of Armco pipes up to 6 ft. dia. encased in 1 ft. or 1 ft. 6 in. concrete.

The entire construction was estimated to cost nearly £2,000,000, and was under the direct supervision of one Executive and three Assistant Executive Engineers and under the general control of the Chief Engineer, Central Railway.



Gadaria River bridge, showing one of the 100-ft. spans being launched

of the labour engaged on opening-out in bad shale, a steel mobile shield was used in the top-half breakout. It acted not only as an overhead protecting shield, but also as a director and a "jumbo" to facilitate both drilling and the erection of the steel supporting framework consisting of cold rolled steel supports, eventually to be encased in the concrete lining. Its rib-spacing varied, according to the soil, from 1 ft. 6 in. to 4 ft. The benching down of the lower half was effected by first opening out a central gullet and then widening, as illustrated.

Equipment for Concrete Lining

Concrete for the lining was poured with the aid of a special pneumatic placer, designed and manufactured by the railway staff at Barkhera, and includes the elaborate equipment illustrated. The placing was first in the floor, then in the walls and finally in the arch, and work in each of these sec-

causing a surging action which packs the concrete by "slugging." The concrete is further consolidated by air-worked immersion vibrators, which are moved forward as the work proceeds, so as to keep them along the periphery of the concrete in rear of the form. Windows are provided in the mobile steel form for pouring and vibrating in the side walls, and also to enable the concrete as it is consolidated in place to be observed. They also allow testing samples to be taken out.

Budni Tunnel

On the reverse curve of the spiral loop a cutting 70 ft. deep was at first begun, but the soil conditions were so bad that it became imperative to design and build a tunnel section to fit into the narrow cutting cross-section excavated. It had to be designed to withstand a variety of possible thrusts and movements in the soil, as well as rock-falls on the arch. To combat the latter

BRITISH STANDARD 857: SAFETY GLASS.—Significant changes in the specifications and tests for both toughened and laminated safety will be introduced in a new edition of B.S. 857. The changes are being introduced to ensure maximum safety for vehicle users, and to meet the current trends in the shape of windscreens and rear lights of transport vehicles. A press conference will be held at British Standards House, 2, Park Street, London, W.1, on May 13, when representatives from the industry, the Road Research Laboratory, and the Ministry of Transport, who have served on the B.S.I. Committee responsible for the revised standard, will explain it in detail.

EXHIBITION OF RAILWAY EQUIPMENT.—The exhibition of railway equipment which British Railways and the London Transport Executive are to stage at Willesden Motive Power Depot from May 25 to May 29 will be the biggest and most varied in this country since the war. Over 100 large exhibits will be on view, including locomotives, carriages, wagons, signalling apparatus, and permanent way equipment. There will also be ship models and various tools and appliances. Making its first public appearance at the exhibition will be British Railways' prototype class "8" 4-6-2 express passenger locomotive, the most powerful heavy-duty passenger engine to be designed since nationalisation. The 13 other locomotives on show will include B.R. standard types as well as diesel, electric, and gas-turbine units. Electric and diesel coaches from the main line railways, and motor coaches from London Transport will also be on view. Among the rolling stock will be the newest types of passenger coaches, 20 different kinds of freight wagons ranging from an 8-ton banana van to a 42-ton steel plate wagon, and 12 different types of containers. Other exhibits will include electrically-operated points, colour-light signals, an automatic telephone exchange, a track-relaying machine, yard-cleaner, frog rammer, brick-work pointing machine, and other apparatus used in railway maintenance work but seldom seen by the general public.

Manchester Suburban Electrification

Development of high-voltage d.c. systems



One of the new multi-unit trains for the Manchester-Glossop service, made up of three-car units

THE local services with multiple-unit trains between Manchester London Road and Glossop that will be introduced with the next stage of the Manchester - Sheffield - Wath electrification will implement the fourth d.c. scheme at over 1,000 V. in this area. Early in the century, when considering Manchester suburban electrification as a consequence of successful working at 630 V. d.c. on the Liverpool-Southport line (which attained its electrification jubilee on March 13), the former Lancashire & Yorkshire Railway decided to investigate the highest practicable voltage.

The adoption of 3,600 V. for the Bury-Holcombe Brook section was decided on in consultation with Dick, Kerr & Co. Ltd. (now incorporated in the English Electric Co. Ltd.), who supplied the substation motor-generator set and the two motor coach equipments. When opened in 1912, this was the first high-voltage d.c. electrification in the world.

Third Rail with Side Contact

Although clearance difficulties with the overhead line caused the voltage to be lowered to 1,200 when the Bury-Manchester section was electrified, this new extension was also distinctive in that the supply was taken from a third rail with side contact, a feature that has not been used elsewhere on the electrified lines of British Railways. Dick, Kerr & Co. Ltd. supplied 60 control equipments for the Manchester-Bury stock, which had motors of that company's design but built by the railway. Power supplies came from two 5,000-kW. turbo-alternators and six

1,000-kW. rotary-converters, all built by Dick, Kerr & Co. Ltd.

The next Manchester suburban electrification was in 1931, when the Manchester South Junction & Altrincham joint line was converted at 1,500 V. d.c. with overhead conductor. This was the first scheme completed after publication of the report of the Railway Electrification Committee (1927), which had recommended the 1,500-V. d.c. overhead system for new work in this country.

This was also the first passenger line in Great Britain to use the 1,500-V. d.c. overhead system, the previous applica-

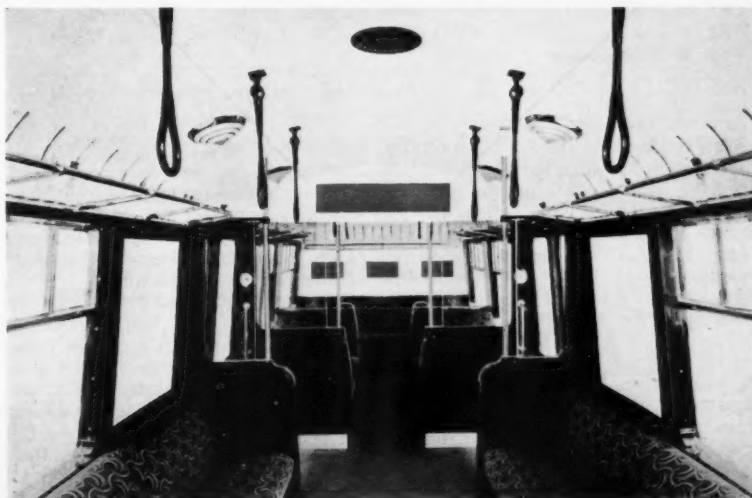
tion of 1,500 V. d.c. having been on the Newport-Shildon goods lines of the North Eastern Railway.

Stock for Glossop Line Service

Stock for the Manchester-Glossop services shortly to be introduced consists of eight three-car sets each composed of motor coach, trailer, and driving trailer. The 1,500-V. d.c. electrical equipments, supplied by the General Electric Co. Ltd., provide four motors in each motor coach with electro-pneumatic contactor control; ratings of the motors are 185 h.p. on full-field and 210 h.p. on weak field.

Power for control circuits, lighting, and other low-voltage requirements is supplied by an auxiliary motor-generator set in conjunction with a floating battery. Mechanical parts of the Manchester-Glossop trains were built by the Metropolitan-Cammell Carriage & Wagon Co. Ltd.

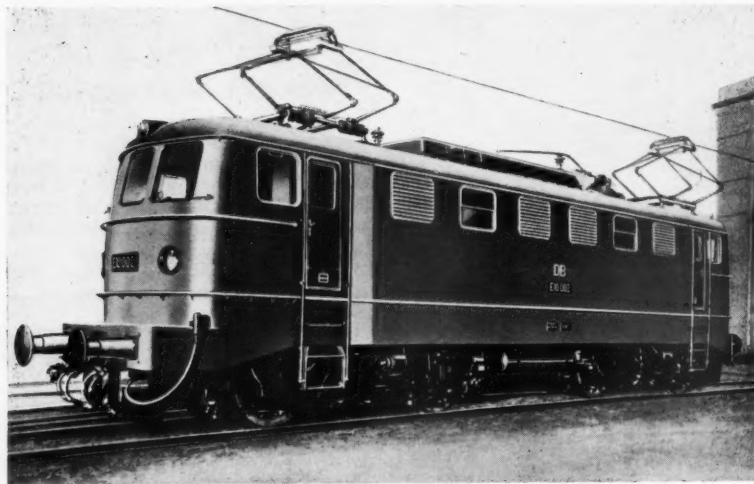
LIGHT ALLOY AIR RESERVOIRS.—With the object of saving weight and increasing durability, investigations have been proceeding for over two years into the development and manufacture of light alloy reservoirs. As a result of co-operation between the Metropolitan-Vickers Electrical Co. Ltd., Westinghouse Brake & Signal Co. Ltd., and James Booth & Co. Ltd., of Birmingham, an aluminium alloy air reservoir is to be installed in the braking system of the British Railways, Metropolitan-Vickers gas-turbine locomotive, to undergo service trials. In addition, Metropolitan-Vickers will install another of these light alloy reservoirs on one of their own diesel-electric shunting locomotives, to permit day-to-day observation of performance.



Interior, lined with birch and sycamore veneered plywood. The seats are covered in moquette, blue in the smoking sections and russet elsewhere

New Bo-Bo Mixed-Traffic Prototype in Germany

Design incorporating motors and transmission similar to Swiss locomotive class with same wheel arrangement



Krupp/Brown Boveri Bo-Bo, German Federal Railway

specially strengthened mountings which permit the hooks to be pulled forward slightly through the end walls.

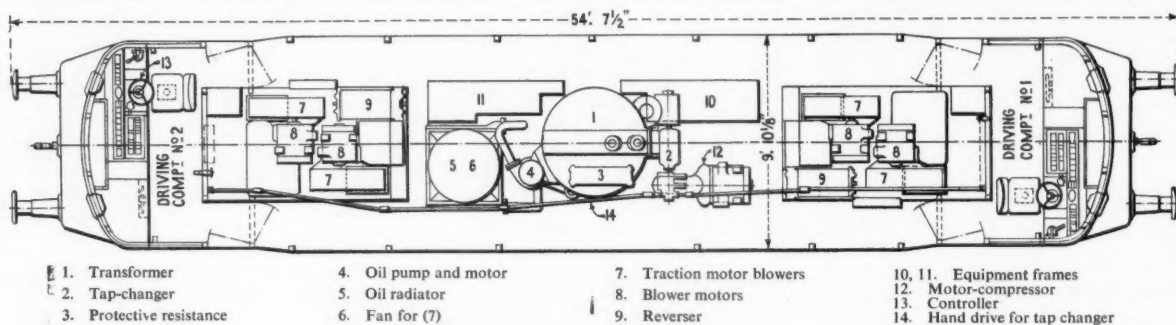
Inside the locomotive body there are two cabs separated by a machinery compartment. A control and instrument desk extends for the full width of each cab. Three windows at each end of the body, the outer ones with double panes and wipers, provide an unobstructed lookout. Heating elements between the double panes of glass prevent internal misting of the windows. Drop windows at each side of the cabs enable the crew to lean out with safety, for the entrance doors are further back, opening into recessed compartments in the rear of the cabs into which the crew can step back from the driving position in case of emergency. Doors give access from these recesses to the side corridors. Two cross passages connect the corridors at different points in order to give convenient access to all parts of the electrical apparatus.

FIVE different prototype Bo-Bo locomotives are undergoing trials on the German Federal Railway in order to establish the most suitable design features to meet the administration's requirement of a mixed-traffic class with wide availability for its 15,000 V., 16½

in structure which transmits the traction and buffing forces. Underframe, sides, and roof form a single all-welded unit. The underframe is built up of light welded plates and can withstand a pressure of 197 tons. It consists essentially of two hollow side sills which are

Bogie Construction and Suspension

The bogie frames are box girders formed of steel plates and welded throughout. A transom connecting the side members incorporates the guideway for the pivot and carries two supports



New Bo-Bo mixed-traffic prototype in Germany

cycles, single-phase system. The service specification to which the various builders have had to conform was given in our September 25 issue, when we described the locomotive built by Krauss-Maffei and A.E.G. The builders of the locomotive now illustrated, No. 10002, were Fried. Krupp Lokomotivfabrik, Essen, for the mechanical parts, and Brown Boveri & Co. Ltd., Mannheim, for the electrical equipment. In brief, the locomotives of this series have to be capable of hauling a 1,280-ton goods train up 1 in 200 at 43.5 m.p.h., or a passenger train of 690 tons up 1 in 100 at 56 m.p.h., both duties being continuously rated.

For economy in weight, the body of the Krupp locomotive is a self-support-

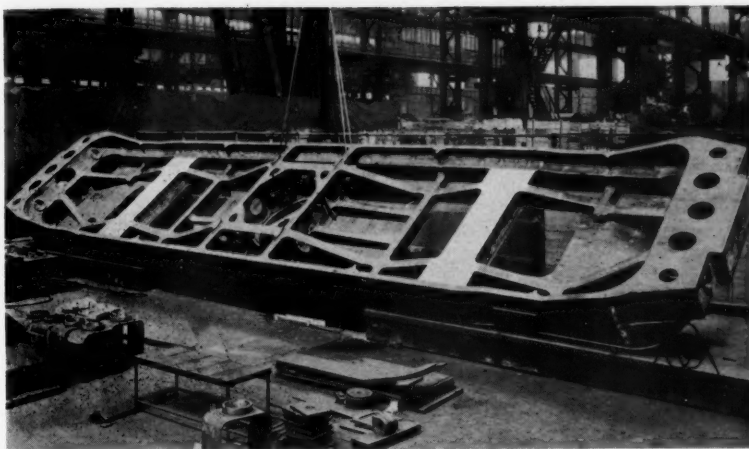
ing structure which transmits the traction and buffing forces. Underframe, sides, and roof form a single all-welded unit. The underframe is built up of light welded plates and can withstand a pressure of 197 tons. It consists essentially of two hollow side sills which are

Cylinders are welded into the two buffer beams and contain tubular pistons. These pistons carry the buffers and incorporate springs through which the buffers bear against the underframe. If the buffing forces exceed 40 tons per buffer, and can no longer be fully taken up by the buffer springs themselves, the piston spring system greatly reduces the shock transmitted to the underframe. The coupling hooks are attached to the body ends by means of

for each traction motor and the gearcase suspensions. The motors are supported at four points and their mountings are arranged so that they can be removed together with the driving axles from below, or individually from above.

Each bogie pivot is rigidly mounted in the underframe and carries slide blocks having lateral movement in the bogie under the control of a centralising system with springs which exercise a restoring force proportional to the amount of displacement. The whole mechanism is enclosed in an oilbath.

The body is supported on the bogies by coil springs in conjunction with swing hangers to accommodate relative movement. The hangers and springs, with their guides, are enclosed in oil-



Underside of the locomotive underframe, showing the method of construction

filled pockets, the latter being housed in the box-shape bogie longerons in such a way that they can be removed from below.

Springing

Coil springs for the axlebox suspension are also housed in the bogie side frame members. The two springs on each side of an axle are connected by an equalising beam, the centre of which rests on the axlebox. A shock-absorber connected to the equalising beam and located above it damps out vibrations transmitted by the axles if these are too severe to be taken up sufficiently by the coil springs.

The axleboxes are formed with cylindrical trunnions at top and bottom, lying on the same vertical axis, the former supported in the bogie frame and the latter in the horn stay with a very small amount of play. Trunnions and guides are enclosed in an oil bath. The guide sleeves have Silentbloc mountings to damp out transverse shocks transmitted from the axles to the bogie frame. A spring coupling is arranged between the bogies to reduce flange wear on curves.

Some principal dimensions and other particulars of the locomotive are tabulated below:—

Length over buffers	... 54 ft. 7½ in.	
Bogie wheelbase	... 10 ft. 9½ in.	
Bogie pivot centres	... 26 ft. 3 in.	
Total wheelbase	... 37 ft. 1 in.	
Wheel diameter (new)	... 4 ft. 1½ in.	
Gear ratio	... 1 : 2.194	
Horsepower (l-hr.)	... 4,397 h.p.	} 49.3 h.p.h. at
Tractive effort (l-hr.)	... 32,545 lb.	
Maximum tractive effort	... 54,000 lb.	
Maximum speed	... 81 m.p.h.	
Adhesive weight	... 81 tons	

Electrical Equipment

Power is taken from the overhead line at 15,000 V. and fed through a high-speed air circuit breaker to a tapped transformer winding connected between line and earth. The variable voltage from the control winding is applied to the primary of the power transformer, across the secondary of which the four traction motors are connected in parallel. By this method of control, the currents which have to be broken when tap-changing are kept very low. For a total motor current of 8,400 amps, the primary current at a transformer ratio of 15,000/475 V. is only 267 amps; and for a motor current of 12,000 amps, while starting it is 380 amps. These

values apply to operation on the highest notch.

The traction motors are similar to those in the Bo-Bo locomotives of the Berne-Lötschberg-Simplon Railway, and as in that design, incorporate a Brown-Boveri disc drives which provide a flexible coupling with the pinions in the independently-mounted gearcases. Each gearcase is supported at one end on the driving axle by means of roller bearings and at the other is suspended from the bogie frame by a hanger with Silentbloc mountings. The force-ventilated motors are 14-pole machines with a 1-hr. rating of 1,040 h.p. At the maximum tractive effort of 54,000 lb., the current in each motor is about 3,100 amps.

Notching is effected by a tap-changer mounted on the transformer and chain-driven by a single-phase capacitor motor. The current is broken by two contactors operating in step with the motion of the rollers which connect the tappings with the busbars. The locomotive can be controlled from one of its own cabs, from a second locomotive, or from a driving trailer. To make this possible the 28-notch controller operates a potentiometer connected across a d.c. circuit, and when it is moved to any running position a potential difference is established compared with the setting of a second potentiometer linked mechanically with the tap-changer. Current is thus caused to flow in one direction or the other through a polarised relay, which operates in the direction necessary to make the tap-changer motor notch up or notch back until balance is restored.

Auxiliaries comprise four traction motor blowers, a fan for the transformer oil radiator, a transformer oil circulating pump, and a compressor. The blowers and compressor are driven by series commutator motors, while the fan and pump for the transformer cooling system are driven by single-phase capacitor motors, all auxiliary machines being connected across a 200 V. winding on the transformer.

IMPROVEMENTS AT IMMINGHAM DOCK.—The Docks & Inland Waterways Board of Management announces that new coaling appliances are to be installed at Immingham Dock at an estimated cost of £800,000. The scheme provides for the replacement of three existing coal hoists at the South Quay by modern equipment. A rotary side tippler, conveyor belt, and hinged radial conveyor will be included. The tippler can deal with high-capacity coal wagons while the radial conveyor will reduce the movement of vessels during loading operations and thus speed up shipment. A telescopic delivery belt will vary the outreach from the quay face so as to distribute coal in the hold. Devices to expedite the discharge of wagons and shipment operations will also be incorporated. The equipment will facilitate turnround of shipping and enable the port to deal quickly with an increasing volume of coal shipments. Last year over

3,000,000 tons of coal were shipped through Immingham Dock, mainly from the East Midland coalfield.

INSTITUTE OF METALS: ADDITIONAL MEETINGS.—A general meeting of the Institute of Metals will be held at 4, Grosvenor Gardens, London, S.W.1, on Thursday, May 27, at 5.30 p.m., when a lecture entitled "Lattice defects and energy stored in deformed metals" will be given by Dr. W. Boas, Head of the Division of Tribophysics, Commonwealth Scientific & Industrial Research Organisation, Melbourne. Another meeting will be held on Wednesday, June 30, at 5 p.m., also at 4, Grosvenor Gardens, when a lecture will be given by Professor E. Crowan, Department of Mechanical Engineering, Massachusetts Institute of Technology, entitled "The brittle fracture of metals: some new developments." The meetings will be open to visitors without tickets. Both

lectures are being given under the auspices of the Metal Physics Committee of the Institute, and are the first in a series by distinguished scientists from overseas that the committee hopes to arrange from time to time.

BRITISH INSULATED CALLENDER'S CABLES EXHIBITS AT THE MECHANICAL HANDLING EXHIBITION.—The exhibits of British Insulated Calender's Cables, Limited, at the forthcoming Mechanical Handling Exhibition at Olympia, will include a comprehensive selection of current collection equipment for cranes, conveyors and electric haulage, which will include copper sections for rigid conductors, and various kinds of grooved trolley wire and extensible tough rubber sheathed flexible cords. The exhibits will also include examples of resilient moulded connectors and couplers, rubber sheathed trailing cables, and lift flexibles.

Victorian Railways Royal Train Journeys

Diesel haulage, with steam-hauled pilot train



The Royal train, hauled by two diesel-electric locomotives, passing through Spencer Street Station, Melbourne

THE Royal train provided by the Victorian Railways for H.M. the Queen and H.R.H. the Duke of Edinburgh, and described in our issue of December 18, 1953, was used for their journey in March through Gippsland and then from Melbourne through northern and central Victoria, passing through many large country centres and the inland cities of Bendigo and Ballarat; from the latter place it travelled south to Geelong, and then east back to Melbourne and up into the hills at Warburton, where a weekend was spent. Two nights and two days were spent on the train. Victoria and New South Wales were the only States in Australia where a Royal train was used, but the Victorian Railways train was the only one in which nights were spent.

During the run through the Melbourne suburbs on the journey from Geelong through Melbourne to Warburton, ordinary traffic was stopped about 20 min. before passage of the Royal train. Crowds on station premises and on the line occasioned slow running additional to the slowings through stations provided for in the schedule, and Warburton, 40 miles from Melbourne, was reached about one hr. late on March 6.

Diesel Haulage

The last journey, on the return to Melbourne, was made on March 8, which was a public holiday. The train was hauled by two diesel-electric locomotives, with the Royal coat of arms mounted in front and on the platform of the rear coach. The pilot train was steam hauled.

In response to popular demand, the train was placed on exhibition at Spencer Street Station, Melbourne, for two weekends after the Queen's departure from Victoria on March 9, and special trains were run on those weekends for visitors to Mel-

bourne. The Victorian and South Australian Railways co-operated in the handling of extra traffic occasioned by the Royal tour of Victoria.

The Victorian Railways revenue during the period of the tour in Victoria is reported to have exceeded all estimates. The closing of Melbourne streets to tram and other traffic accounted for a marked increase in railway suburban traffic.

NEED FOR EXPANSION IN INDUSTRY.—The President of the Federation of British Industries, Sir Harry Pilkington, speaking to Midland region members in Birmingham recently, said that many firms, particularly those of fairly small or moderate size, had, until recently, hesitated whether to grow beyond their present scale, to invest more money, or to mechanise yet more, because they felt uncertain about the future. There had been a sudden realisation that markets at home and abroad are greater than before the war and are still growing. There was an opportunity to be grasped. "Make do and mend," he said, had been a very good policy during these times of inflation, but the corollary was "Get busy and spend." They should spend for posterity, in bricks and mortar, steel, cement, and machinery. Britain was more firmly set on the road to a real revival than at any time since the war, he thought, and there was scope for competition and co-operation between firms. The two things were not mutually exclusive, but complementary, and could best live side by side.



H.M. the Queen alighting from the Royal train at Aircraft Siding Platform; the Royal coat of arms was also borne on the front of the leading diesel-electric locomotive

RAILWAY NEWS SECTION

PERSONAL

Mr. N. M. Thadani, Deputy Chief Engineer, Central Railway, India, has been appointed Chief Engineer of the system. The appointment is effective as from March 26 of this year.

We regret to record the death on May 2 of Mr. John Amphlett Parker, formerly of the Bengal Nagpur Railway, India.

Mr. G. E. Woodhead, Works Maintenance Assistant at Euston Headquarters, London Midland Region, British Railways, has been appointed District Engineer, Derby (South), as from April 12 of this year.

Director of the British Aluminium Co. Ltd., is retiring on July 4. He will be succeeded by Mr. W. J. Thomas. Mr. Boex will remain a director of the company and will be available as a consultant.

Mr. C. F. Barnard, Managing Director of Mirlees, Bickerton & Day, Limited, has been appointed Joint Managing Director of Associated British Oil Engines (Marine) Limited, with Mr. J. Jones, Managing Director of the National Gas & Oil Engine Co. Ltd.

Mr. H. B. Parr, who, as recorded in our April 23 issue, has been appointed Assistant General Freight Traffic Manager of the Canadian National Railways, was born

Messrs. H. A. Short, C.B.E., M.C., A. T. Evans.

Secretary: Mr. F. L. Hick.

The office of the Committee is at Neville Street, Newcastle-upon-Tyne, 1.

Mr. J. C. Radcliffe, O.B.E., J.P., who is a representative of shipping, has been appointed a member of the Transport Users Consultative Committee for Wales and Monmouthshire.

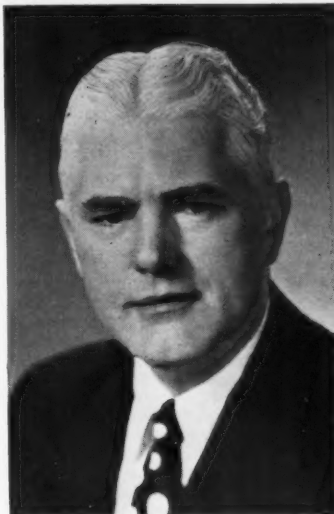
Mr. R. G. Smerdon, M.C., has been appointed to act temporarily as a member of the Transport Arbitration Tribunal during the illness of Mr. W. H. Nevill.

Mr. Harold A. Simons, Assistant General



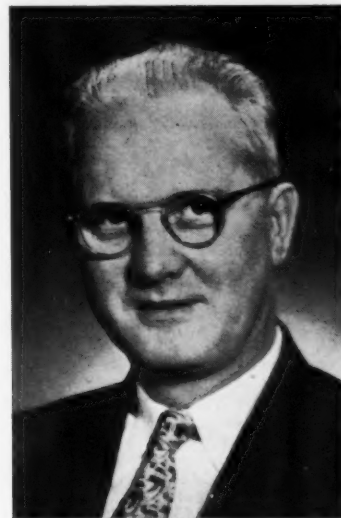
Mr. R. H. Botha

Appointed Chief Superintendent (Parliamentary), South African Railways



Mr. H. B. Parr

Appointed Assistant General Freight Traffic Manager, C.N.R.



Mr. H. A. Simons

General Manager, Sleeping, Dining & Parlour Car Department, C.N.R.

Mr. Ralph H. Botha, Administrative Secretary to the South African Minister of Transport, who, as recorded in our April 30 issue, has been appointed Chief Superintendent (Parliamentary), General Manager's Office, Johannesburg, South African Railways, joined the S.A.R. as a clerk at Kroonstad, Orange Free State, on October 2, 1934. He was transferred to the Staff Office of the System Manager at Bloemfontein on January 14, 1935. Mr. Botha subsequently occupied the positions of Personal Clerk to the System Manager at Bloemfontein and at Johannesburg; Principal Clerk, Development Section, Headquarters, Johannesburg; Principal Clerk, Ministry of Transport, Pretoria; Secretary to the S.A.R. & H. Railway Board, Pretoria; and Administrative Secretary to the Minister of Transport, the position he now relinquishes to become Chief Superintendent (Parliamentary). Mr. Botha also acted as secretary to the South African Railways Overseas Mission during 1946.

Mr. J. P. Ford has been elected Chairman of the Council of the Institute of Export. He is Managing Director of Associated British Oil Engines (Export) Limited, National Oil Engines (Export) Limited, and Brush Export Limited.

Mr. George Boex, Joint Managing

in Toronto on May 20, 1901. He began his career in January, 1919, when he joined the Grand Trunk Railway at Toronto in the District Freight Agent's office. He transferred to Montreal with the General Freight Agent in June, 1923, and won steady promotion in the traffic department where he became Assistant Freight Traffic Manager for the Canadian Lines of the company. Since 1951 he has been engaged in re-organising the Sleeping, Dining & Parlour Car Department.

TRANSPORT USERS CONSULTATIVE COMMITTEE, NORTH EASTERN AREA

The following have been appointed members of the Committee for the North Eastern Area until March 31, 1957:—

Chairman: Sir Mark Hodgson, O.B.E., D.C.L., J.P.

Members—(Representing Agriculture): Mr. R. H. Bulmer. (Representing Industry): Messrs. K. Harper, A. R. Polson, J. E. Peacock, M.Inst.T., S. J. Adamson. (Representing Commerce): Mr. K. H. L. Cooper, Alderman J. Gray, J.P. (Representing Shipping): Mr. H. N. Constantine. (Representing Labour): Messrs. F. Burr, M.B.E., R. Stanley. (Representing Local Authorities): Alderman Colonel R. Mould-Graham, O.B.E., M.C., T.D., D.L., J.P., Councillor T. W. Atkinson. (Representing the British Transport Commission):

Manager, Sleeping, Dining & Parlour Car Department, Canadian National Railways, who, as recorded in our April 23 issue, has been appointed General Manager of the Sleeping, Dining & Parlour Car Department of the Canadian National Railways, is a native of Montreal. He joined the company in 1918 as a clerk in the Motive Power & Car Equipment Department there. He transferred to the Hotel Department in 1929 and served at the Chateau Laurier Hotel, Jasper Park Lodge and Minaki Lodge. He joined the Sleeping, Dining & Parlour Car Department in 1934, becoming successively Chief Clerk, Supervisor, Assistant to General Manager, and, in 1953, Assistant General Manager.

Sir Andrew Macharg has expressed a wish to retire from the board of the North British Locomotive Co. Ltd., and the directors recommend that his place be taken by Mr. Hugh Cowan-Douglas. They also propose that Mr. H. A. Siepmann be elected to the board.

Mr. James Barrie, Vice-Chairman of the Road Haulage Association, has been elected National Chairman of the Association. He has been succeeded as Vice-Chairman by Mr. J. H. G. Barber, Messrs. C. W. H. Sparrow, J. H. Male, and R. G. Crowther were re-elected Vice-Chairmen.



Mr. W. N. Pellow
Motive Power Superintendent,
Western Region, 1950-54



Mr. J. C. Foster
District Motive Power Superintendent,
Crewe, L.M. Region, 1948-54



Mr. N. R. Peach
Appointed District Motive Power Superintendent
Crewe, L.M. Region

Mr. W. N. Pellow, M.I.Mech.E., M.I.Loco.E., Motive Power Superintendent, Western Region, British Railways, who, as recorded in our May 7 issue, retired on May 5 on reaching the age of 65, has completed more than 50 years of railway service. Mr. Pellow, who was born in May, 1889, at Par, Cornwall, entered the service of the Great Western Railway Company at St. Blazey, Cornwall, in 1904, as an apprentice to engine turning, fitting, and erecting. In June, 1908, he transferred to the main repair works at Swindon, where he completed his six-year apprenticeship under the then Mechanical Engineer, the late Mr. G. J. Churchward. After some experience in the Materials Testing House, Mr. Pellow entered the Drawing Office at Swindon in February, 1912, where he served for some time in the Locomotive Design Section. In August, 1922, he transferred to the office of the Divisional Superintendent

at Newport, Mon., as Divisional Inspector, later becoming Assistant to the Divisional Superintendent there. In July, 1924, he became Assistant Locomotive, Carriage & Wagon Superintendent, Wolverhampton Division, returning to Swindon in October, 1929, as Assistant to the Locomotive Running Superintendent & Outdoor Assistant to the Chief Mechanical Engineer, Mr. C. B. Collett. He left Swindon again in July, 1931, to become Divisional Locomotive, Carriage & Wagon Superintendent at Bristol, transferring in 1939 to London to take up a similar position with headquarters at Old Oak Common. In July, 1941, he returned to Swindon to become Locomotive Running Superintendent & Outdoor Assistant to the then Chief Mechanical Engineer, Mr. F. W. Hawkesworth. As a result of nationalisation, the Chief Mechanical Engineer's department of the Great Western Railway was broken

up, and the Motive Power Department of the Western Region was formed in January, 1950. Mr. Pellow became the first Motive Power Superintendent, Western Region, from which position he has now retired. Among other activities he was, until his retirement, President and a Trustee of the Great Western Railway Enginemen & Firemen's Mutual Assurance, Sick & Superannuation Society, President of the Great Western Railway Mechanics Institute, Swindon, and President of British Railways, Western Region (Swindon) Athletic Association. Mr. Pellow is a member of Wiltshire County Cricket Club Committee, and a member of the Wilts County Committee of the National Playing Fields Association.

Mr. James Cecil Foster, District Motive Power Superintendent, Crewe, London Midland Region, British Railways, who, as recorded in our April 23 issue, retired



Mr. T. S. Lascelles
Managing Director, W. R. Sykes Interlocking
Signal Co. Ltd., 1953-54



Mr. F. J. Sykes
Appointed Managing Director,
W. R. Sykes Interlocking Signal Co. Ltd.



Mr. Norman G. Kershaw
Appointed General Manager,
W. R. Sykes Interlocking Signal Co. Ltd.

last month, has completed 42 years of railway service this year. Mr. Foster, who was born at Derby in 1894 and educated at Derby School, Derby Technical College, and Edinburgh University College, received early training in the workshops and drawing office of the Midland Railway at Derby. During the 1914-18 war, he served in the drawing office of the Ministry of Munitions under Sir Henry Fowler, and later in France, Belgium and Germany with the Light Railway Field and Army Troops. In May, 1920, Mr. Foster was appointed Assistant District Locomotive Superintendent, Sheffield, becoming Assistant to the Superintendent of Motive Power, Derby, in 1923. He served on a committee dealing with modernisation of running shed facilities in 1931-32, and, in 1933, on a committee dealing with locomotive user. In the same year he was appointed Assistant to the Divisional Superintendent of Operation (Motive Power) at Crewe, becoming District Locomotive Superintendent, Crewe, in 1943. Locomotive depots under his charge were those at Crewe, Stafford, Stoke, Alsager, Uttoxeter, and Whitchurch. In 1948, the position of District Locomotive Superintendent was re-designated Motive Power Superintendent. At the time of his retirement, Mr. Foster was Vice-President of the St. John Ambulance Brigade, Crewe Corps, one of the founders of the Crewe Motive Power Welfare Society, and Chairman of Crewe North Canteen & Dining Club.

Mr. N. R. Peach, A.M.I.Loco.E., Assistant Divisional Motive Power Superintendent, Crewe, London Midland Region, British Railways, who, as recorded in our April 23 issue, has been appointed District Motive Power Superintendent, Crewe, as from May 1, was educated at Derby, and joined the former L.M.S. as an apprentice at Derby in 1924, later becoming a privilege apprentice. After serving an improver's course in the Motive Power Department, he was appointed draughtsman in the office of the Superintendent of Motive Power, Derby, and later at Euston. Mr. Peach became Foreman Fitter at Derby Motive Power Depot in 1936, Assistant District Locomotive Superintendent, Kentish Town, in 1938, and Assistant District Locomotive Superintendent, Camden, in 1943. In this capacity he was transferred temporarily to Willesden in July, 1945, before being appointed District Locomotive Superintendent, Plaistow, in November of that year. In 1946, Mr. Peach went to Kentish Town as District Locomotive Superintendent, and, in 1947, to Crewe as Assistant Divisional Motive Power Superintendent.

Mr. T. S. Lascelles, Managing Director of W. R. Sykes Interlocking Signal Co. Ltd., who, as recorded in our May 7 issue, has retired, joined the company in 1909. He was engaged at first on the construction of mechanical locking frames and signal fittings, then being manufactured for the company at the works of the Low Moor Company, Bradford, and later on the installation of block and track circuits and other electrical apparatus on various railways, chiefly in the south of England, but also in Scotland and Ireland. After being in the drawing office and acting as Assistant to the late Mr. F. J. Sykes, Senior, he became Signal Engineer to the company in 1927, and, in August, 1942, was appointed a Director and General Manager. He has been closely connected with the work of the Institution of Railway Signal Engineers, which he joined in 1913, and was a Member of Council

from 1925 to 1935, when he succeeded the late Mr. A. B. Wallis as Honorary Treasurer. In October, 1947, he became Honorary General Secretary & Treasurer and continued in that combined office until December 31, 1949, shortly afterwards being elected a Vice-President. From 1924 to the end of the 1939-45 war he had charge of the Institution's library and was Honorary Editor of its *Journal* from 1936 to 1947. He was President of the Institution for the year 1953. Mr. Lascelles was a member of the Three-Position Signalling Committee appointed in 1922 and has been active in other committees dealing with the Thoroughgood Bequest and the Institution's examinations. He has always taken an especial interest in signalling practice in other countries, on which he contributed papers to the Institution's proceedings, and has for many years maintained correspondence with signal engineers and operating officers on the Continent and elsewhere. Mr. Lascelles became Managing Director of W. R. Sykes Interlocking Signal Co. Ltd. in 1953.

Mr. Frederick John Sykes, who, as recorded in our May 7 issue, succeeds Mr. T. S. Lascelles as Managing Director of W. R. Sykes Interlocking Signal Co. Ltd., was born on April 21, 1910, and educated at Clapham College and Regent Street Polytechnic, where he completed a course of mechanical engineering. Mr. Sykes entered the employment of W. R. Sykes Interlocking Signal Co. Ltd. in 1928. He completed three years practical work in the mechanical and electrical departments, joining the staff of the Drawing Office in 1931. He was appointed Technical Assistant in 1935, in which capacity he worked on the development of railway signalling apparatus and locomotive lubricating equipment, later in conjunction with the Baird Television Laboratories. He was appointed Director & Chief Engineer in 1942 and Director & General Manager in 1953. His new appointment as Managing Director takes effect from May 1 this year.

Mr. Norman G. Kershaw, who, as recorded in our May 7 issue, has been appointed General Manager of W. R. Sykes Interlocking Signal Co. Ltd., was born on January 18, 1909, and educated at St. Paul's School. He joined Westinghouse Brake & Signal Co. Ltd. in September, 1926, as a pupil at the Chippenham works of the company. After 2½ years training in the Foundry, Pattern, Machine, Fitting and Stamp shops, and the Electrical Testing Department, he was transferred to the Signal Engineering Department at the company's London office. He took charge of the Signal, Colliery, & Rectifier Drawing Office in 1934 under the Chief Mechanical Engineer, and, when a Mechanical Engineering Department was formed in 1945, he was appointed head of this department, becoming Mechanical Development Engineer in 1946. In January, 1953, Mr. Kershaw became Assistant General Manager of W. R. Sykes Interlocking Signal Co. Ltd., being appointed to his new position on the first of this month.

Mr. J. R. Greenwood, Chairman of Craven Bros. (Manchester) Ltd., has been appointed Director & Deputy Chairman of Crossley Motors Limited.

Mr. William Bentley, Joint Managing Director of the Bentley Engineering Co. Ltd., parent company of the group, has been appointed Chairman and Managing Director of Mellor Bromley & Co. Ltd. He succeeds Mr. W. L. James, who will retain his seat on the board and the chair-

manship of Pegson Limited, another member of the Bentley Group.

Mr. John Creek has been appointed Sales Director of Fibreglass Limited.

Mr. Alfred Dudley Vickers has joined the board of the Indian Iron & Steel Co. Ltd.

Mr. Norman K. Beattie has been appointed a Director of Keith, Blackman & Co. Ltd.

Mr. G. P. Clay, M.A., has been appointed a Director and Chief Engineer of Imperial Chemical Industries Limited.

Sir Henry Wilson Smith has been appointed Deputy Chairman of Powell Duffryn Limited.

Mr. S. J. Young has resigned from the board of A.B.C. Coupler & Engineering Co. Ltd.

Mr. Alan Grant has been appointed Manager of the Sales Department (Cable Estimating) of Johnson & Phillips, Limited.

Mr. G. R. Marsh, who is a Director of Wickman Limited, has been appointed Managing Director of the company.

Mr. A. J. Budd, B.Sc.Tech., has been appointed Assistant Superintendent, Leonard Works, of Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester, 17.

Mr. F. N. Lloyd, Chairman & Managing Director of F. H. Lloyd & Co. Ltd., has been elected Chairman of the British Steel Founders' Association.

Mr. T. S. Kilpatrick, Director & Commercial Manager of the Workington Iron & Steel Company, has been appointed a Director of the Distington Engineering Co. Ltd. As from May 3, he is Commercial Manager of both concerns.

Mr. E. Percy Edwards and Mr. C. T. Parkin have been appointed Joint Managing Directors of the Lapointe Machine Tool Co. Ltd. Mr. A. Hollen, formerly Northern Technical Representative, has been appointed a Director of the company.

Mr. L. E. Mold, O.B.E., M.I.E.E., has retired from the board of A. Reyrolle & Co., Ltd. He joined the company 40 years ago, and has been a Director for 16 years. Mr. G. J. Dodgson, Deputy Secretary of the company, has been appointed Secretary in succession to the late Mr. J. C. Arkless.

Mr. W. W. Harrison, Staff Manager of Shell-Mex & B.P. Limited since 1948, retired on April 26 after 42 years of service with the company and its predecessors. He is succeeded by Mr. H. R. Brewster, who has been with the company since 1937 and has been Deputy Staff Manager since last October.

CHEAP FARES TO THE LANCASHIRE COAST.—The London Midland Region of British Railways have announced that from June 1 considerable reductions will be made in the day excursion fares from over 200 Lancashire and Cheshire stations to the Lancashire seaside resorts of Blackpool, Fleetwood, Morecambe, Lytham, Ansdell, St. Annes and Thornton Cleveleys. There will also be reductions to Lancaster. Day excursion tickets available by specific trains will be reduced by up to 3s.

Ministry of Transport Accident Report

*Near Abington, August 8, 1953:
British Railways, Scottish Region*

Lt-Colonel G. R. S. Wilson, Chief Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the derailment which took place near Abington at 5.31 p.m. on August 8, 1953, to the down "Royal Scot" express consisting of 13 bogie vehicles drawn by a class "8P" 4-6-2 engine No. 46231. It was a fine day with continuous sunshine and, for the locality, unusually warm. The rails had not been expanding freely and heavy compressive stresses had become released to buckle the track as the leading coaches passed.

Nothing on the engine or train contributed to the accident. The vehicles were all of the British Railways new standard all-steel type with strengthened underframes and had central Buckeye couplings throughout. The last seven became derailed. Damage was remarkably slight and there were no very serious injuries. The site is isolated but assistance arrived with the minimum of delay. The engine and five vehicles with the uninjured passengers, left at 8.37 p.m. An up express was stopped at the next box to the north. Heavy cranes arrived about 9 p.m. and both lines were open again at 6.40 p.m. the following day.

The Track

The initial derailment occurred on bullheaded track 32 yd. beyond the junction with a straight length of 113 lb. flat bottom. This bullhead track was 475 yd. long on an easy right-hand curve and was followed by another length of 113 lb. rail, on which the engine came to rest with the leading nine coaches. Most of the bullhead length was swept away as the chairs were smashed. This was responsible for the more serious consequences to the last four vehicles, which lost their bogies. Although little structural damage occurred to the bodies and underframes of the three passenger vehicles, the side of the brake-van was badly torn away.

The train was on the descent from Beattock. Traffic is considerable there with 56 down and rather more up trains daily. Speed through Abington is usually 60-70 m.p.h., but uphill is generally not so high. On the down line after Abington station there is a left-hand curve laid with 109-lb. f.b. rails. This is followed by the 113-lb. already mentioned, 820 yd. long, after which comes the 95-lb. b.h. A series of flange marks crossing the second rail of this length were found. The 113-lb. track was laid in 1949, with 4-hole fishplates; the b.h. track was resleepered in 1944, the rails being new in 1925, except that there were new ones where the connection was made with the 113-lb. rail, which was very little worn and had sleepers in first class condition. No elastic spikes appeared to be working loose, gauge and alignment were good and no distortion was found after the accident. There were, however, some appreciable variations in cross level.

The report gives details of these matters and certain voidmeter measurements. The first pair of b.h. rails (1949), were little worn but the remainder had, in their 28 years, lost an appreciable proportion of their section, but with average weight of 86 lb. were fit for retention in a running line. General running conditions, shown by Hallade records, between the station

and point of derailment can only be described as fair.

Colonel Wilson naturally directed particular attention to the expansion gaps and gives figures and measurements taken about 3 hr. after the derailment for the last seven rails of the 113-lb. track. The gaps were irregular and all but one of the last seven of the cess rail ones were closed. The condition of those on the newer 109-lb. rails in rear was similar, with the rails just warm to the touch. The creep measured on August 10 on the 113-lb. rails showed maxima of $3\frac{1}{2}$ in. on the cess rail and $2\frac{1}{2}$ in. on the 6-ft. rail in the down direction. No creep anchors were fitted.

Ballast

Ballast on the down line on the 113-lb. rail and the 95-lb. rail at site of initial derailment was clean mixed slag and whinstone of rather small gauge. It was 1 or 2 in. below sleeper tops in the 4 ft. but the 6 ft. was not as well filled and the ballast sloped away on the cess side between the rails and ends of the sleepers, which were partly exposed, whence it assumed its natural slope without horizontal shoulder. On the up line for some distance it was clogged and dirty; in an attempt to drain it the whole shoulder in the cess had been removed leaving the sleeper ends fully exposed and in some cases the last inch or two unsupported. The report gives details of the temperatures recorded at the nearest meteorological station at comparable altitude. Range of temperature on August 8 was 26 deg., from 50 deg. early morning to 76 deg. at 4 p.m. It was 75 deg. when the accident occurred and the warmest summer day in the locality.

Evidence

A 55-wagon freight train passed about $\frac{1}{2}$ hr. earlier and the crew saw and felt nothing wrong. The enginemen of the express had long experience of the route. The driver said he was not trying to regain time. (It seemed that speed might have been 65 m.p.h. at derailment: permitted maximum is 70.) After passing under a bridge 1,549 yd. beyond the station he felt "a drag on the brake" and the fireman told him a coach was swaying. He made a full brake application but vacuum became destroyed by the train parting. He had experienced no out of ordinary movement and saw no track distortion. The fireman noted a slight bump and the train not riding easily. Looking back he saw a coach (probably the ninth) was derailed. Going forward to protect the up line he ran $\frac{1}{2}$ mile and then saw the other express being held at the signal box in advance.

The guard saw nothing of the course of the derailment but was thrown down in the van which stopped very quickly and eventually overturned. Uninjured, he made sure the up line was protected, went to Abington and telephoned to Control.

The ganger, 63, had been in charge for 25 years; he had three men and his gang had been at full strength for a considerable time with few changes.

The Permanent Way Inspector, 49, was appointed to act as Assistant to the Chief P.W. Inspector, Glasgow South, in 1949 and went to Beattock in May, 1952, dealing there with approximately 30 miles of main line.

The ganger said that in March, fishplates

had been cleaned and oiled. In a hot spell, about three weeks before the accident, he noticed a few rather wide gaps in the last rail lengths of the 113-lb. track; on slackening the bolts one or two rails moved. He did not touch the bullhead fishplates as the gaps were well open. (No higher temperature than 64 deg. was recorded at Eskdalemuir Observatory during the last three weeks of July.) During July he had worked through the bullhead on the down line, lifting and packing low joints and hanging sleepers. He intended to lift and pack the 113-lb. track, where necessary, at first opportunity. He drew the inspector's attention to the creep of only 1 in. in May in hot weather, suggesting the rails required pulling back, but the inspector did not regard this as serious. (Adjustment of a long length of f.b. track requiring all spikes to be drawn would be beyond his gang's capacity.) On the morning of the accident a lengthman carried out daily track maintenance between 7 and 9.30 a.m., when there was no heat and no closed joints. The ganger passed the site of the derailment at 4.15. There was expansion but no joint was closed tight. (He maintained this when told of the gap measurements given in the report.) He slackened off one or two fishplates on the 113-lb. length and heard the rails creak. He had to tighten quite a number of keys on the b.h. track, where, however, there was plenty of expansion. He considered the down line well ballasted and removed the ballast from the up line cess on his own initiative; it was the only way "to get water out of the road" where clay was working up. His inspector had seen every few days, who gave him good practical guidance on his work. The chief inspector would visit probably every two months. It was some years since he had spoken to the District Engineer.

The leading lengthman confirmed this generally and said that on the day before the accident the 113-lb. gaps were fairly well closed up, $\frac{1}{16}$ in. or less, but he did not consider them dangerous, although the morning was quite cool.

The Permanent Way Inspector walked over his 30-mile section of main line about once a week and inspected this length about five days before the derailment. It was midday and close with no sun. The joints of the 113-lb. track were not "hard pressed" but his attention was directed to some "slight" creep, up to 2 in. The ganger spoke to him about it earlier in the summer, but he felt no immediate attention to be required. The good grip of the spikes prevented creep and the heavier rails were less sensitive to heat. With such a condition in b.h. track he would have told the ganger to pull back but that was a much bigger job on f.b.: all spikes needed drawing. He noted the b.h. gaps to be well open and did not suspect the fishplates of binding. He would have expected the ganger to loosen without further reminder. Satisfied with the general condition of the line he agreed that ballast was weak in places and did not disclaim his own responsibility. He had been "frightened" over some b.h. track between f.b. on a viaduct in June and ordered more ballast. Generally he took all that was available for more important relaying work. He was expecting to put in an open drain where there was lack of

ballast in the cess, difficult to do except on Sundays owing to the traffic. He spoke of the instructions issued from time to time about the risk of buckling; he had been personally warned by the District Engineer in June. His evidence generally was entirely straightforward; he felt his judgment at fault in not adjusting the 113-lb. gaps after being twice told of the creep.

The Chief Permanent Way Inspector, a man of 62 with 33 years' service, had held this position in the Glasgow South District for 10 years. Normally he would visit this length about every two months. He thought it well maintained with $\frac{1}{2}$ -in. rail gaps on the f.b. rail and plenty of expansion on the b.h. He was satisfied after the accident that the rails were moving in the fishplates, noting oil on the surfaces. Ballast on the down line was fair and on the up quite safe for fast traffic with none in the cess but he told the inspector "to get some more slack on to it." He could not suggest how the track had moved under the train unless "there was something wrong with the coaches." The ganger, a man of long experience, had found everything all right that day and should know what was required of him. Had the Inspector required adjustment for creep he could have called on adjacent gangs or used his relaying gang or failing that, have applied to him for help. In June he had told all inspectors to attend to expansion and creep at once.

The District Engineer, whose area included 874 running track miles and 540 miles of sidings, with a total p.w. staff of 1,742, had been in charge four years. He set himself to inspect about 40 ganger's lengths a year on foot, say about 100 route miles, and would cover the whole Gretna-Glasgow line in about three years. He could not recollect walking over this ganger's length but had been at Abington and inspected track north of the site of the derailment. His knowledge was based primarily on Hallade recordings and he made an inspection between Carstairs and Gretna about once a month from his saloon. He tried to walk over as much track as he could, amid other commitments. Annual length-marking was shared between himself and four or five of his staff in rotation. He himself had not yet dealt with this particular length. Its average marking in the previous four years had been 852 out of 1,000. (880 would be "very good," 860 "good" and 840 "fair.") The down line was a good average piece of track although with too much creep. Inspectors were apt to be deterred by the magnitude of dealing with that on f.b. rail. It required extra gangs and "possession." The inspector, busy with relaying, might have misjudged the risk he was taking in the event of a hot spell, but there was difficulty in drawing spikes and the possibility of not holding well when re-driven in the same holes. The inspector had to cope with heavy arrears left by a predecessor. Very full instructions had been sent out about track distortion in hot weather and the inspector was responsible for passing them on, with whom he himself would take things up if he found them not being attended to.

The Civil Engineer and his assistant arrived 3 hr. after the derailment. Neither was satisfied with the down line. Action ought to have been taken to adjust expansion gaps and creep on the f.b. track and there was insufficient ballast. The up line was unfit for fast running without ballast in the cess. The difficulty of pulling back f.b. rail with elastic spikes was unduly stressed.

Colonel Wilson was furnished with

copies of instructions issued by the Civil Engineer's and District Engineer's offices since 1948. These began with a notice to Inspectors from minutes of the Civil Engineer's Committee of the Railway and London Transport Executives which had specially considered the matter after the Wath Road derailment (*The Railway Gazette*, January 14, 1949). These instructions, amplified in the light of other derailments, as at Merstham (see our issue of December 16, 1949), were re-issued every Spring by the Civil Engineer's Office, Scottish Region, to all District Engineers. Emphasis was laid on them at the periodical meetings of engineering staff. All inspectors received them. The District Engineer concerned in this case sent a special letter to his Chief Inspector in April, 1951, and enclosed copies of a circular dealing with "essential precautions against buckling of track" for distribution to inspectors and gangers. His last written instructions were sent to the Chief and other inspectors in April, 1952, followed by a brief circular in June, 1953. Details of these documents, which place continual emphasis on the regulation of creep and expansion gaps, loosening fishplates, and sufficiency of ballast, are given in the report. They were consolidated in a booklet on practical aspects of track maintenance "Codes of Practice for Gangers and Sub-Gangers and Lengthmen," which was widely distributed. The ganger in this case had a copy. The code is supplemented by instructional films on all aspects of track maintenance, including prevention of heat distortion, shown annually to all gangers. It was last seen by this ganger about the autumn of 1952.

Track Distortions in 1953

The report also contains details of distortions of track in 1953, one on the same day as this accident, not resulting in derailment, and of another which did, where the rear coach of an express left the rails and became re-railed without serious damage. In one case there was no creep and the cause was irregular expansion. In another there was creep and the buckling came from the push of f.b. track on weak b.h. Old sleepers had been left under "closers" when the f.b. track was laid. In the third there was distortion on a 40-yd. length of b.h. track following 1,609 yd. of 109-lb. f.b. on which the joints were closed tight and there was 3 in. of creep and marked deficiency of ballast on the b.h. length. An inspector had failed to realise the need for prompt action. Attention had been drawn to this in July and three days after Abington a memorandum was sent out requiring special measures to be taken where f.b. track is joined to b.h. including reinforcement of ballast.

Chief Inspecting Officer's Conclusion

The rails on either side of the joint between the different types of track had not been expanding freely and were under heavy compression. The track stayed in line but was unstable and the engine and first few vehicles released the stress, so distorting the track as to make derailment inevitable. It most likely began with the seventh vehicle. Probably the f.b. rails were thrusting heavily against the considerably lighter b.h. ones and the conclusion is that the latter were not moving. The fishplates had not been loosened since annual cleaning and oiling. Distortion reached its maximum where the lateral strength of the rails, worn to 86-lb., was only about $\frac{2}{5}$ ths of that of the 113-lb. ones behind. Probably the track would have held, had it been supported by well

consolidated ballast to standard cross section, with full horizontal shoulder at sleeper ends. Insufficient attention had been paid to fundamental points, stressed repeatedly in instructions. The ganger had drawn attention twice to the creep, after which it was beyond his responsibility, as correction was beyond his gang's capacity.

Colonel Wilson is satisfied that he had removed and oiled fishplates correctly in the spring, but surprisingly had not appreciated the significance of the wide gaps between the b.h. rails which apparently persisted under all temperature conditions during the summer, being present when he passed two hours before the accident. Nor does Colonel Wilson disbelieve that the inspector had reminded him to make sure that the rails were expanding freely; he thinks the ganger was unresponsive to the full meaning of instructions.

More responsibility rests with the inspector, directly responsible for maintenance, who understood the precautions required. Although special arrangements would have been necessary to correct it, the creep on the f.b. track should not have been tolerated, a serious error of judgment the inspector acknowledged. He was too easily satisfied with the ballast on the down line and his acquiescence in its removal from the up cess confirmed the impression that he had not appreciated the standard of maintenance required on this line.

The overriding responsibility for safety must always be the District Engineer's first charge and although he had been careful to pass on and add to the instructions sent to him on heat distortion, Colonel Wilson thinks he was in insufficiently close personal touch with the conditions and the work of gangers to ensure appropriate standards being maintained and due regard paid to essential well established precautions. He had never walked over this length during his four years in charge and is considered to have been unduly satisfied with its condition after the derailment. Colonel Wilson feels he had not been well served by his Chief P.W. Inspector, who seemed reluctant to accept that any condition of the track could have brought about the derailment.

Remarks

Experience has shown b.h. track adjacent to heavy f.b. track particularly liable to distortion in hot weather if maintenance is not good. The memorandum issued in August to District Engineers laid emphasis on strength of ballast and firm packing, but its necessity was to be regretted, as a derailment at Racks on June 25 had given a clear warning and the deficiencies which brought about the one at Abington were remarkably similar. It was fortunate there was no loss of life. Consequences might well have been more serious if the rolling stock had not been of the latest construction. The special ballasting and other work required by the memorandum was completed in Scotland by the end of September. The Chief Regional Manager has taken appropriate steps to emphasise the continuing personal responsibility of the Engineers for the efficiency of all grades of track maintenance staff and no doubt the circumstances of this accident will be duly noted in the other Regions.

Rail creep always has presented a problem, particularly on falling gradients where there is heavy braking. Need for it to be adjusted in good time had been stressed in every instruction above referred to. No doubt the operation is troublesome on f.b. track with elastic spikes, 144

having to be drawn in each 60 ft. rail length and then redriven. It is all the more important to check creep in this track by good maintenance, with firm packing, ample ballast in cribs, and adequate tensioning of the spike fastenings. Further investigation may be desirable into the holding power of the spikes against creep at all stages in track life, and more extensive use might be made of rail anchors; none was fitted in this case.

It is impossible to guarantee no rail compression on the hottest day but it can be kept within bounds by timely measures, if there is plenty of well consolidated stone ballast. There should be no need to emphasise this, but it might be considered whether ballast of rather larger gauge than usual in this country would be advantageous, now beater packing has been largely superseded by shovel packing with fine chippings.

Road Haulage Association Annual Luncheon

Mr. Alan Lennox-Boyd, Minister of Transport & Civil Aviation, proposing the toast of the Road Haulage Association at the Association's annual luncheon at Grosvenor House, London, W.1, on May 11, said that the Government had fulfilled all the promises it had made to create conditions favourable for the return of road haulage to private enterprise.

Under denationalisation of road haulage, about 4,000 vehicles—about one-third of the total so far offered—had been sold back to private firms.

In the disposal of nationalised road haulage assets, he said, the Road Haulage Disposal Board was under the obligation to secure the best possible prices. There was no disagreement between the Board and the British Transport Commission in the disposal of road haulage assets, and he wished to pay a tribute to both these bodies for the useful work they had done and were doing.

Mr. Lennox-Boyd looked forward to worthwhile offers for the larger units to be disposed of. He thanked the R.H.A. for keeping the road hauliers together and for expressing their views.

Mr. Bernard Winterbottom, Chairman of the Road Haulage Association, who presided, said in the course of his reply that whilst 1947, the year of the Labour Government Transport Act, stifled opportunity in the road haulage industry, 1953 released it. There was a greater will to work now than when men could not see how they could ever own or enlarge their businesses.

Given reasonable selling prices, the road haulage assets of the Commission, could be sold quickly, but sale would be difficult to do so if it were expected to show a profit on all sales, despite the levy imposed by the new Act. He deplored the burden of taxation on the road haulage industry and went on to advocate a uniform speed limit of 15 m.p.h. for all normal commercial vehicles.

Lord Brabazon of Tara, replying to the toast of the guests, which had been proposed by Mr. James Barrie, Vice-Chairman of the Association, said there should be a national agreed policy for transport. The Treasury, he said, should make grants for building and improving roads.

Others present included:—

Viscount Hinchinbrooke, Sir Gilmour Jenkins, Messrs. A. H. E. Molson, R. Morton Mitchell, David Renton Lord Teynham, Mr. G. Wilson

Western Region Rehabilitation Workshops Opened

A rehabilitation workshops, the first of its type to be opened by British Railways, was officially opened at Swindon Works on May 10 by Lady Benstead, wife of Sir John Benstead, Deputy Chairman of the British Transport Commission. The object is to provide productive work for injured railwaymen of the Western Region, whether the injury was sustained on or off duty, and to provide an occupation of therapeutic value, by adapting machinery to give a form of graduated work to limbs or muscles. The scheme is carried out under supervision of Western Region medical officers. In wishing the project every success Lady Benstead said it marked a further step in the interest taken by the British Transport Commission in the treatment of injuries to railway staff to enable them to return to productive work. The scheme would do much to prevent, what might well be, a somewhat demoralising effect on an injured workman, in that during convalescence he could be employed on light productive work which would do much to prepare him to return to his normal work. Those present included:—

Sir John Benstead; Messrs. K. W. C. Grand, Chief Regional Manager, British Railways, Western Region; W. P. Allen, Chief of Establishment & Staff, British Transport Commission; R. Burgoyne, Regional Staff Officer, British Railways, Western Region; Dr. C. T. Newnham, Regional Medical Officer, British Railways, Western Region; Messrs. R. A. Smeddle, Mechanical & Electrical Engineer; C. T. Roberts, Carriage & Wagon Engineer; H. G. Kerry, Assistant Motive Power Superintendent; C. J. Rider, Public Relations & Publicity Officer, British Railways, Western Region; and Dr. P. F. A. Watkins, Medical Officer (Swindon).

Improved Refreshment Facilities at Swindon

As the development of the policy of providing refreshment facilities, in accord with public demand, the refreshment room and dining room on the down platform at Swindon station have been completely redecorated and refurnished.

The layout provides for a cafeteria self-service from which light refreshments, hot meals, and hot and cold beverages will be available. Adjoining this is a licensed bar. The cafeteria counter top is in stainless steel, while the front is of red relief Waverite, the cafeteria screen being predominantly of stainless steel, glass and grey finaweave Waverite. The bar counter is of walnut and grey finaweave. A new Semtex floor covering has been laid throughout. The decorative treatment is in pleasant pastel colours.

The remainder of the premises on the platform level has been converted to provide modern facilities in the way of a kitchen, wash-up, store, platform trolley servicing room, a staff mess room and office for the manageress. The walls of the kitchen and wash-up have been tiled and the floor is of asphalt.

The decorative treatment of this area is in contrast with the public room. There is a proposal in hand to carry out improvements to the refreshment room on the up platform. These will provide for self-service of light refreshments.

This modernisation work at Swindon, supplements similar facilities provided at

Paddington and Bristol, and will be followed by improvements at other Western Region stations at Reading, Newport, Oxford, and Swansea, for which schemes already are in hand.

The cafeteria was opened on May 10 by Sir John Benstead, Deputy Chairman, British Transport Commission. Others present included:—

Messrs. K. W. C. Grand, Chief Regional Manager; R. A. Smeddle, Mechanical & Electrical Engineer; C. T. Roberts, Carriage & Wagon Engineer; H. G. Kerry, Assistant Motive Power Superintendent; and C. J. Rider, Public Relations & Publicity Officer, Western Region; Mr. E. K. Portman-Dixon, British Transport Hotels & Catering Services.

Staff & Labour Matters

Railway Wages

A meeting took place on May 4 between representatives of the B.T.C. and of the N.U.R., A.S.L.E.F. and T.S.S.A., on the question of the salary and wage structure for British Railways. A further meeting will be arranged.

Engineering Workers Wages

Demands for a general increase in the rates of pay of engineering workers were rejected by delegates to the annual conference of the Amalgamated Engineering Union at Blackpool last week. Instead, a resolution was carried calling for the introduction of a comprehensive wage structure in the industry. Recommendations have been made from time to time in the past by independent bodies that the employers and unions should give their attention to the industry's wage structure, and the resolution passed on May 4 proposes a revision of the scales in accordance with present circumstances. The conference will be recalled to review the position not more than three months after the annual meeting of the C.S.E.U.

One of the resolutions which was rejected asked for increases in the minimum rates while the other was for a general increase of 10 per cent in rates of pay.

Questions in Parliament

Railway Reorganisation Scheme

In replying to Mr. Ernest Davies (Enfield E.—Lab.), who had asked when the White Paper on the railway reorganisation scheme would be available to Members, Mr. Alan Lennox-Boyd (Minister of Transport & Civil Aviation) said on May 5: I received the scheme from the B.T.C. on April 15 and, in accordance with the provisions of Section 17(1) of the Transport Act, 1953, I am consulting the interests specially concerned. When I have done this, I must consider, after consultation with the Commission, whether any modification of the scheme is desirable. I shall then present a White Paper to the House.

Mr. Davies hoped the Minister was consulting the trade unions concerned besides other interested parties. He asked whether, when the White Paper was presented to Parliament, there would be a debate and whether, in the light of the debate, the scheme would be amended, if desired, and then a Statutory Instrument then presented. Could the Minister give the House any idea how long he expected the consultations to take?

Mr. Lennox-Boyd said the trade unions would be consulted. The purpose of preparing a White Paper was to secure a debate in Parliament before he formally pre-

sented the scheme. He did not know how long all that would take. They were pressing on as fast as they could and he thanked the Commission for the care and speed with which it had handed the proposals to him.

Railway Reorganisation in Scotland

Mr. J. McInnes (Glasgow Central—Lab.) asked in the House of Commons on May 5 when the B.T.C. was likely to submit a scheme for reorganisation and for the appointment of an authority for the railway undertaking in Scotland in accordance with the Transport Act, 1953.

Mr. Alan Lennox-Boyd (Minister of Transport & Civil Aviation), in a written reply, stated: The Commission submitted the scheme to me on April 15 and I am now consulting the interests likely to be specially affected by it. The scheme includes provision for an authority for Scotland.

Railway Superannuitants

In the House of Commons on May 5 Mr. P. F. Remnant (Wokingham—C.) asked how many British Railways superannuitants had received benefit from the scheme announced by him on March 17, 1953; and what was the total additional sum being paid out a year.

Mr. Alan Lennox-Boyd stated in a written answer that under the B.T.C. scheme for supplementing the pensions of certain British Railways superannuitants, approximately 2,650 persons were receiving supplements at an approximate annual cost to the Commission of £33,900.

Contracts & Tenders

Metropolitan-Vickers Electrical Co. Ltd. has received an order for 60 1,200 h.p. six-axle and 34 550 h.p. four-axle diesel electric locomotives from Coras Iompair Eireann. The electrical equipment will be manufactured by the company at its Manchester and Sheffield works, the diesel engines by Crossley Bros. Ltd., and the mechanical parts by Metropolitan-Cammell Carriage & Wagon Co. Ltd.

British Railways, North Eastern Region, have placed the undermentioned contract:—

G. Stephenson (Builders & Contractors) Limited, Bishop Auckland: provision of new roadways at Darlington Goods Depot

The Maschinenfabrik Esslingen has received an order from the Argentine National Railways for two 12-coupled metre-gauge rack-and-adhesion steam locomotives of 107 tons estimated weight.

The Cie. Internationale des Wagons-Lits has placed orders for 80 Budd type 20 (single) berth sleeping cars as follows:—Ateliers Métallurgiques de Nivelles, 25; Etablissements Carrel Fouché & Cie., 25; Societa Anonima Fiat (Milan), 15; Societa Anonima Ansaldo (Genoa), 15.

The United Kingdom Trade Commissioner at Madras has reported that the Stores Purchase Committee, Bangalore, is calling for tenders (Enquiry No. 11865) for the supply of a diesel locomotive required for the Bhadra reservoir works, Lakka-vally. The closing date for the receipt of tenders is May 31.

Tenders should be submitted to the Secretary, Stores Purchase Committee, Bangalore.

A copy of the tender documents, including specifications and conditions of contract, is available for loan to United Kingdom firms from the Board of Trade, Export Services Branch, Lacon House, Theobalds Road, London, W.C.1.

All inquiries by telephone should be made to Chancery 4411, extension 738 or 771. United Kingdom firms who propose to tender are asked to advise the Export Services Branch, quoting reference number ESB/11759/54 and, at the same time, include the name of their overseas agent (if any) through whom they are submitting quotations, so that the Board's Officer at Madras may be informed.

The Director General of Supplies & Disposals, New Delhi, is inviting tenders for:

4,275 carrier dummy coupling brake (M.G.) to IRS drawing No. W-939 alt. 2 and I.R.S. specification No. M-5-54

4,275 swan neck pipes for carriages and wagons to IRS drawing No. 128 WAR alt. 3 and to IRS specification No. R3/53 (MC.1)

Tenders are to be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16265-E/IV.

As the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender form can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" branch, and drawings can be seen at the offices of Hodges Bennett & Company, 59/60, Petty France, London, S.W.1, from whom copies may be obtained if required at a fixed price per sheet.

The Director General of Supplies & Disposals, New Delhi, is inviting tenders for:

12 coupling rods (front) leading (R.H.) for B and P class locomotives to O.T.R. drawing No. LM/23 item A (DGI & S. No. 3567).

12 coupling rods (front) leading (L.H.) (as above)

12 coupling rods hind trailing (R.H.) (as above)

12 coupling rods hind trailing (L.H.) (as above)

All items to I.R.S.S. No. M-26/53 Class X.

Tenders are to be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16086-E/11, and will be received up to 10 a.m. on May 20.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender form can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" branch and drawings can be seen at the offices of Hodges Bennett & Company, 59/60, Petty France, London, S.W.1, from whom copies

may be obtained if required at a fixed price per sheet.

The Director General of Supplies & Disposals, New Delhi, is inviting tenders for:—

150 casings for buffers class II or III to M.S.M.R. drawing No. WH2/1/1 Model "Z" (ISD No. 13501) and to IRS. specification No. M 3/49 class II or III and to IRS. No. R-10/36

Tenders are to be submitted to the Director-General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16090-E/111 and will be received up to 10 a.m. on May 24.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender form can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" Branch and drawings can be seen at the offices of Hodges, Bennett & Company, 59/60, Petty France, London, S.W.1, from whom copies may be obtained if required at a fixed price per sheet.

The Director General of Supplies & Disposals, New Delhi, is inviting tenders for:

(a) DGS. & D. No. 17284-D, 8,300 buffer recoil washers $5\frac{1}{2}$ in. dia. $\times \frac{1}{2}$ in. thick $\times 2\frac{3}{4}$ in. dia. hole, to I.R.S. specification No. M 5/48 class II

(b) DGS. & D. No. 17285, 900 long case buffer washers to Ex. B.N. Rly. L.W. drawing WF. 17 alt. 1 (DGI. & S. No. 402) and I.R.S.S. M 5/48 class II

(c) DGS. & D. No. 17282, 4,200 washers for buffer spindle $4\frac{1}{2}$ in. dia. $\times \frac{1}{2}$ in. thick $\times 1\frac{1}{8}$ in. dia. hole to I.R.S. specification No. M 5/48 class II

Tenders are to be submitted to the Director General, Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, India, quoting reference SRI/17284-D/III, and will be received up to 10 a.m. on May 28, 1954.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender form can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" branch and drawings can be seen at the offices of Hodges Bennett & Company, 59/60, Petty France, London, S.W.1, from whom copies may be obtained if required at a fixed price per sheet.

The United Kingdom Trade Commissioner at Delhi has reported that the Directorate General of Supplies & Disposals, New Delhi, is inviting tenders for supply of 280 cones bronze class II, I.R.S. specification No. N.6 Injector delivery 10 M/M fig. 2, reversible pattern injectors, Simplex type, to I.R. part drawing No. L/IR.612/X.

The stores are required by September 30, 1954. If delivery cannot be made before this date, tenderers should state

the earliest delivery date they can offer. The closing date for receipt of tenders is June 4.

If there is insufficient time in which to obtain the documents from India, tenderers are advised to submit quotations by letter and, at the same time, ask for a set of the tender documents to be sent to them, which documents they should undertake to complete and return as soon as possible on the basis of the quotations made by letter.

A set of the tender documents, including conditions of contract but not including drawings, is available from the Board of Trade Export Services Branch, Lacon House, Theobalds Road, London, W.C.1, for loan to United Kingdom firms in order of application.

All enquiries by telephone relating to this circular should be made to Chancery 4411, extension 738 or 771.

U.K. firms who propose to tender are asked to advise the Board of Trade Export Services Branch, quoting reference number E.S.B./11230/54, and, at the same time, include the name of their overseas agent, if any, through whom they are submitting quotations, so that the Board of Trade officer at Delhi may be informed.

CONVEYANCER FORK TRUCKS.—At the Mechanical Handling Exhibition, to be held at Olympia in June, Conveyancer Fork Trucks Limited will be showing a range of fork-lift trucks and fittings, which will include both battery-electric and diesel types, and also a fully flameproofed I.C. engined truck, Model F.T.C. 4/20. A torque converter transmission is embodied in this model, eliminating both clutch and conventional gearbox. Model T.C. 6-20, of 6,000 lb. capacity, will be shown fitted with a Head Wrightson Manipulet designed to handle hot forging pieces. Model E4-20 will be shown with a paper roll hydraulic clamp which permits reels of paper to be lifted and rotated through 180 deg. This enables reels to be stacked vertically.

TRANSPORTATION CLUB ANNUAL GENERAL MEETING.—Mr. K. W. C. Grand, Chairman of the Transportation Club, in his statement at the annual general meeting on May 6, said that the total income for the year ended December 31, 1953, consisting of members' subscriptions and profit on catering, bar, and so on, amounted to £9,548 16s. 8d., and after deducting all expenses, including amortisation of lease, and debenture interest, there was an adverse balance of £132 19s. 10d. Against this, special donations of £231 5s. were received which had resulted in a surplus of £98 5s. 2d. for the year. After deducting this amount from the accumulated loss of £1,112 0s. 2d. at December 31, 1952, there is a loss of £1,013 15s., to be carried forward. He referred to the retirement as Secretary of Colonel K. R. N. Speir, who had been elected an Honorary Life Member of the Club, and welcomed his successor, Captain St. John Cronyn, R.N. He then read a letter received just before the meeting, from the Locomotive Manufacturers' Association, enclosing a cheque for 250 guineas, to which editorial reference is made on another page. In his reply to the Association, Mr. Grand has expressed the gratitude of Club members and their satisfaction that the Association feels that the Club is fulfilling a useful purpose and contributing to the work of transport.

Notes and News

Foreman Fitter Required.—A foreman fitter is required by the Sierra Leone Government Railway for one tour of 12 to 24 months in the first instance. See Official Notices on page 563.

Leyland Coaches and Buses for Eire.—A new fleet of 50 Leyland Royal Tiger luxury coaches is to be operated on tourist services by Coras Iompair Eireann. Twenty of the coaches are expected to be in service this year. C.I.E. have also placed an order with Leyland Motors Limited for more than 30 Titan chassis.

Disposal of Transport Units.—The Road Haulage Disposal Board and the British Transport Commission announced on May 5 that the position in regard to the disposal of units offered for sale in List No. R.1, advertised on February 24, was that the highest tenders were accepted for 19 units, representing 253 vehicles. All tenders for 43 units were rejected (665 vehicles), no bids were received for 15 units (253 vehicles) and no decision had been reached in the case of 19 units (281 vehicles). All were offered with premises.

Railway Students' Association: Annual Convention at Exeter.—The annual convention of the Railway Students' Association will be held at Exeter, from Thursday, July 8, to Tuesday, July 13. A paper will be given on Friday morning, July 9, by Mr. A. H. Thorter, Department of Geography, University of the South West, entitled "The South-west of England—the geographical background of the occupations of the people," and on Saturday morning, July 10, Mr. D. H. Hawkeswood, District Commercial Superintendent, British Railways, Western Region, will give a paper entitled "The practical traffic problems of the West Country." Mr. David Blee, President of the Association, has signified his intention of being present.

Norwegian Railway Centenary



The bust of G. P. Bidder, which is to be presented to the General Manager of the Norwegian Railways (see page 538)

during the earlier part of the convention. Applications by those wishing to take part in the Convention should be sent to committee representatives by Monday, May 31.

Intensive Railcar Traffic in Ulster.—An indication of the volume of traffic that can be handled by multi-engined diesel railcars comes from the Ulster Transport Authority, which recently transported 21,000 passengers in two days on the Bangor line. Seven six-car trains powered by modified Leyland bus engines were employed, each train having seats for just over 400 passengers.

Ransomes and Rapier Limited Dividend.—The directors of Ransomes & Rapier Limited propose a final ordinary dividend of 5 per cent, making a total of 7 per cent for 1953 on capital raised from £446,000 to £502,000 by an issue of shares for cash. Similar payments were made for the previous year on the former capital. Profits for the year were £112,728, compared with £126,093 for 1952. Taxation amounted to £122,686 (£196,066).

New Railways Opened on Gold Coast.—The new lines, totalling 36 miles, from Achimota, near Accra, to Tema, and from Tema to the Shai Hills were opened on May 11 by the Officer Administering the Government, Sir Reginald Saloway. The line from Achimota, it is reported, will be used initially for transporting materials and equipment for building a new harbour, and later become an essential link in the railway system. The Tema-Shai Hills line is to be used for carrying rock for building about two and a half miles of harbour breakwaters, and may later be extended north to the Volta if the Volta River hydro-electric scheme is proceeded with.

London Transport Sunday Bus Trips.—The postwar scheme of running special pleasure bus trips from the suburbs to popular London open air attractions on summer Sundays and bank holidays is being extended by London Transport this year. They started on May 9 and will continue until the autumn. Last year 100,000 Londoners travelled by these buses, which this year will run on 56 different routes from 165 London suburbs. London Airport, to which 23,000 people travelled in this way last year, is expected to be the main attraction, and other destinations will include Hampton Court, Chessington Zoo, Richmond, Windsor, and Whipsnade. There will also be special circular sight-seeing tours of the City and West End. These circular tours will run from Victoria, Potters Bar, Barnet, North Finchley, Uxbridge, and Hayes.

Morgan M122 Insulating Concrete.—The Morgan Crucible Co., Ltd., has developed a low heat-storage concrete known as M122, for use as an insulating layer between the refractory and furnace shell, hot air ducts, recuperator and regenerator passages. It can also be used for the manufacture of special shapes, for repair work, or as a backing-up insulator. The material has a maximum service temperature of 2,200 deg. F., and when mixed with water, approximately one gallon of water being added to one cwt. of material, can be cast or poured into position. If mechanical vibration is used, it should not be continued beyond the point where water commences to show on the surface. Except in the case of small quantities, it is desirable to use a concrete mixer. A special grade for application by "gunning," known as M122 Gunning mix,

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

WORKS MANAGER required for Rolling Stock Builders abroad. Previous experience in the manufacture of Steel Railway Vehicles is desirable, although not essential, but applicants should have previously held a managerial appointment. Commencing salary up to an equivalent of £188 monthly, but according to qualifications. Provident Fund, free quarters, car, medical attention and passages for family. Apply in writing only stating age and whether married and giving full details of experience and technical education, to Box 207, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

having similar physical properties to the M122 insulating concrete, has also been developed by the firm.

Parsons Engineering Co. Ltd.—The London Office of the Parsons Engineering Co. Ltd., has moved from Duke's Court, St. James's, to Cavendish Square. The new address is: 9/10, Cavendish Square, London, W.1. Telephone: Langham 8351/2/3.

Southern Region Special Excursions.—To view the Royal Yacht *Britannia* proceeding up Channel, a special excursion will be run from Waterloo to Portsmouth Harbour today. Passengers will join a steamer for a trip in the Solent at an inclusive fare of 21s. The special train leaves Waterloo at 2.38 p.m., returning from Portsmouth Harbour at 8.11 p.m. A similar excursion will also be run from the Brighton, Eastbourne, and Worthing areas. Numerous cheap day tickets and excursions will be available tomorrow for passengers wishing to travel to London to see the procession of the Royal Barge from Tower Bridge to Westminster.

Pullman Car Company: B.T.C. Official Statement.—In connection with the proposal that the British Transport Commission should acquire a controlling interest in the Pullman Car Co. Ltd., the subject of editorial comment in our May 7 issue, the Commission in a statement last week emphasised that it is not intended there should be any alteration in the control and operation of the Pullman cars, nor that the specialised service given by the Pullman Car Co. Ltd. should be altered in any way whatsoever. It would be the intention of the British Transport Commission, the statement adds, to continue the Pullman car service and "to give consideration to the extension of this popular facility on other lines throughout the country."

Birmingham Railway Carriage & Wagon Co., Ltd.—The one hundredth annual meeting of the Birmingham Railway Carriage & Wagon Co., Ltd., was held at Birmingham recently; Sir Bernard D. F. Docker, Chairman of the company, presided. In his statement, circulated with the report and accounts for 1953, the Chairman drew attention to the effects of the shortage in the supply of steel plate and the reduction in works personnel. The financial results had not been as favourable as in recent years. He hoped that the improvement in the steel position in 1954 would enable the works to be employed to greater capacity in the current year. On the opening of the centenary year he pointed out that the firm had, a few years ago, broadened the scope of its

FOREMAN FITTER required by the SIERRA LEONE GOVERNMENT RAILWAY for one tour of 18 to 24 months in the first instance. Option of appointment (a) on contract with gratuity of up to £150 a year and salary, etc., in scale £798 rising to £1,178 a year or (b) on agreement with prospect of permanency with salary, etc., in scale £742 rising to £1,092 a year. Outfit allowance £60. Free passages for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for maintenance in U.K. Liberal leave on full salary. Candidates must have served an apprenticeship as a Loco fitter and have had at least 4 years subsequent Running Shed experience. Must be able to effect service repairs and to maintain Locomotives between shopping periods. Must be conversant with Walschaert valve gear. Diesel experience desirable. Write to the Crown Agents, 4, Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/36493/RA.

activities by developing a determined interest in the diesel field of rail transport. Some considerable repute could be claimed from the diesel trains and locomotives designed and built by the company. The proportion of export to home trade suffered a further drop in 1953 and it was to be hoped that the recent steps towards the freeing of sterling would be the beginning of an attempt to make it possible once again to trade abroad freely. Financial results for 1953 were given briefly in our issue of April 16.

Potteries Motor Traction Company Results.—A final dividend of 5 per cent on increased capital, making 10 per cent for the year 1953 (the same as last year) is recommended. The net profit, subject to audit, is £73,475 (£69,095), after deduction of tax of £87,550 (£2,320) and depreciation of £140,642 (£121,547). The general reserve receives £25,000 (£45,000), and £45,125 (£46,027) is carried forward. The directors state that in 1952, by reason of unexhausted statutory allowance, it was unnecessary to provide for income-tax on profits. These allowances have now been fully utilised.

Insulating Materials at B.I.F.—At the Castle Bromwich section of the British Industries Fair a range of insulating materials for electrical and other applications was shown by Permali Limited. They included insulating block joints exhibited as applied to a 90-lb. BH. rail plain joint, a 95-lb. BH. or 109-lb. FB. rail step joint, and a combined running and check rail joint. Other classes of Permali materials were shown for switchgear and high-voltage overhead line insulation; also specimens of 22 kV., 33 kV., and 66 kV. condenser bushings. Another sphere of application for Permali was represented by exhibits of silent gears, bearings, and other mechanically-stressed parts. Several examples were shown of a grade of Permali used for the fabrication of chemically-resistant structures and components.

Cottage Homes for Retired Railwaymen.—Weekly contributions made by railwaymen, averaging 2½d. a week made possible the recent opening of eight cottage homes in Harris Street, Darlington, for eight retired railwaymen and their wives. The fund from which the cottages were built already has 380 cottage homes in 46 different towns and cities in the North-east, and the average rent is 2s. 9d. a week. Membership at the present time is 29,555. The fund was started in 1919 as a war memorial. It was named the North Eastern Railway Cottage Homes & Benefit Fund. Between July, 1919, and December, 1953, £402,403 was received in small contributions. Benefits to members during that

FOR SALE 550 tons approximately, good reliable original weight 95 lb. F.B. Rail with fishplates to suit. Apply Box 211, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

THE "PAGET" LOCOMOTIVE. Hitherto unpublished details of Sir Cecil Paget's heroic experiments. Eight single-acting cylinders with rotary valves. An application of the principles of the Willans central-valve engine to the steam locomotive. By James Clayton, M.B.E., M.I.Mech.E. Reprinted from *The Railway Gazette*, November 2, 1945. Price 2s. Post free 2s. 3d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press, Limited, 33, Tothill Street, London, S.W.1.

time who have been off duty through illness for extended periods total £157,356. The 388 cottages have been built with the remainder. Since 1929, 1,406 retired members have been housed in these cottages. When one member of a partnership dies, the one remaining is allowed to live out the remaining years in the same house. The opening of the cottages was performed by Mr. H. A. Short, Chief Regional Manager, North Eastern Region, British Railways, accompanied by the Mayor of Darlington, Councillor Charles Anderson, himself a railwayman.

Southern Region Poster.—A poster has been designed by the Southern Region of British Railways to publicise cheap fare



facilities available to London on the occasion of the return of H.M. the Queen to this country. The poster, which is illustrated above, is also being used by other Regions at stations from which cheap tickets are available.

British S.G. Iron Producers' Association.—The formation is announced of the British S.G. Iron Producers' Association from amongst producers in Great Britain and Northern Ireland of Spheroidal Graphite iron castings. The Association has been brought into being to facilitate the exchange of information on the manufacture of this new material, and to encourage its use in the large diversity of applications for which it is suitable. It is also co-operating with the British Standard Institution in the preparation of a specification.

Mr. P. A. Russell and Mr. W. R. Cooper have been elected Chairman and Vice-Chairman respectively, and Mr. C. Gresty has been appointed Honorary Treasurer. Over 80 per cent of the active producers of S.G. iron in this country are founder members of the Association. The Secretariat and offices are at 94/98, Petty France, London, S.W.1.

Skefko Ball Bearing Co. Ltd.—Presiding at the annual general meeting on April 28 of the Skefko Ball Bearing Co. Ltd., whose results for 1953 were summarised in our April 16 issue, the Chairman, Lord Glyn of Farnborough, said that during 1953 the level of trading had been well maintained and as a result of the policy of keeping manufacturing resources up to date they had been able to show a satisfactory profit and report a notable increase in the volume of overseas trading. He would strongly recommend stockholders to study the wage problems confronting the engineering industry. There was no doubt, he added, that competitive trading at home and overseas was becoming even more intense. It would require a continuous effort by all concerned to maintain efficient and economical production and to preserve the high standard of their products. He was confident that whatever might be the difficulties they would be able to hold their share of the business available to the industry.

Leopoldina Railway Co. Ltd.—The liquidators' report for the year ended December 27, 1953, the second year of the winding-up of the Leopoldina Railway Co. Ltd., mentions the results of the mission to Brazil last year to deal with outstanding matters in connection with the company's voluntary liquidation. It proved possible to recommend a distribution of a total of £662,916, which was paid out on December 1, 1953. In accordance with the general scheme of arrangement, £292,811 was paid to holders of the 4 per cent debenture stock and £38,496 to holders of the 6½ per cent terminable debentures. This £331,307 represents the final amount payable to the holders of these stocks. Holders of the preference stock, £6 per cent, received £170,720, and holders of the ordinary stock, £2 6s. 10d. per cent, received £160,889. This distribution, together with that made on September 30, 1952, brings the total distribution to date to £34 per cent for the preference stockholders and to £13 6s. 10d. per cent for ordinary stockholders.

C. A. Parsons & Co. Ltd. Record Output.—The report for 1953 of C. A. Parsons & Co. Ltd. states that this was a year of record output. The value of turbo-generators, turbo-blowers, transformers, and other equipment brought into account during 1953 was 24 per cent higher than in 1952, itself a year of record output. The profit for the year after providing for taxation is £807,862, being £6,736 less than that of last year, despite increased trading. The directors recommend payment of a final dividend of 10½d. a share, less tax, which, with the interim dividend already paid, makes the total payment equivalent to 1s. 6d. a share, less tax, on the increased capital. The report points out that it is in the national interest, and in the long-term interests of shareholders, to review selling prices constantly and take every possible opportunity to stabilise or even reduce selling prices. Increasing competition in overseas markets has been experienced during the year and is becoming more marked with each tender submitted.

Forthcoming Meetings

May 18 (Tue.) to May 20 (Thu.).—Public Transport Association Conference at Blackpool.

May 22 (Sat.).—Permanent Way Institution, Leeds & Bradford Section, at 2.30 p.m. Afternoon visit to the North Eastern Gas Board, West Yorkshire Gas Grid, Teagley, near Wakefield.

May 26 (Wed.) to May 29 (Sat.).—British Railways & London Transport Exhibition of latest developments of railway locomotives, rolling stock, and engineering equipment at Willesden Motive Power Depot. Wednesday 3 to 7 p.m. Thursday to Saturday inclusive, 10 a.m. to 7 p.m.

May 26 (Wed.).—Railway Students' Association, at the London School of Economics & Political Science, Houghton Street, London, W.C.2, at 6.15 p.m. Annual general meeting.

May 28 (Fri.). to May 30 (Sun.).—Institution of Railway Signal Engineers'. Summer meeting at Utrecht, by invitation of the General Manager, Netherlands Railways.

May 28 (Fri.) to June 7 (Mon.).—British Railways, Southern Region, Lecture & Debating Society. Continental tour.

May 29 (Sat.).—Royal Engineers' Association, London Group. Second London sapper reunion, at the Duke of York's Headquarters, Chelsea, S.W.3, from 7 to 11 p.m.

May 31 (Mon.).—Indian State Railways. At the Rembrandt Hotel, South Kensington, S.W.7, at 7 for 7.30 p.m. Annual dinner.

June 9 (Wed.) to June 19 (Sat.).—Mechanical Handling Exhibition, at Olympia, London.

June 11 (Fri.).—Railway Club, at 82, Fetter Lane, E.C.4, at 7 p.m. Paper entitled "The Tallylyn Railway," by Mr. T. W. Robertson.

Until September 25 (Sat.).—"Popular Carriage" Exhibition (Two centuries of carriage design for road and rail) in the Shareholders' Meeting Room, Euston Station, London, N.W.1. Weekdays 10 a.m. to 7 p.m.; Sundays 2 to 7 p.m.

Railway Stock Market

There was again a substantial volume of business passing in stock markets, and after a little profit-taking after recent big gains in British Funds and industrial shares, renewed demand was in evidence. Sentiment continued to be helped by continued talk of the possibility of a reduction in the bank rate, and further dividend increases have produced good features in the share market. The rise in values during recent weeks has been so pronounced that it is not surprising the view is gaining ground that they may be high enough for the time being. It is realised that the more immediate outlook may be influenced a good deal by Indo-China developments and the outcome of the Geneva conference. On the other hand, the fact that there is very little selling despite recent big gains, means that markets are none too well supplied with stock. Consequently even moderate demand tends to have a strong influence on prices.

Foreign rails remained quiet, apart from activity in Manila Railway debentures and shares, which continue to be quoted below their break-up values. The "A" and "B" debentures changed hands around 141 and 134½ respectively, the preference shares were 18s. 10½d., and the 1s. ordinary shares 8s. 9d.

Antofagasta ordinary stock was 8½ and the preference 40. Dorada Railway ordinary stock showed a fair number of dealings around 75. Guayaquil & Quito 5 per cent, first bonds were dealt in around 51½, while Brazil Rail bonds strengthened to 7.

Canadian Pacifics were \$42½, with the 4 per cent preference stock £65½ and the 4 per cent debentures £90½. White Pass no par value shares have been less active around \$24 with the convertible debentures £87½.

Nitrate Rails shares became firmer at 21s. 3d. and Taltal Railway shares were 14s. 6d.

Costa Rica ordinary stock was again quoted at 9 and the 6½ per cent second debentures 45½. Business at \$76½ was marked in the preferred stock of International of Central America. San Paulo 4s. units were quoted at 3s.

Nyasaland Railways 3½ per cent debentures were 78½. Midland of Western Australia have been less active and quoted at 22 with the 4½ per cent debentures showing business up to 96½ and the income debentures quoted at 42½.

Road transport shares remained firm. They are held mainly as long-term investments in view of the good financial positions of most of the companies and their excellent dividend record over a long period of years. West Riding were 34s. 9d., Southdown 32s. and Lancashire Transport 49s. East Kent were 25s., Devon General 29s. 6d. and Rhondda Transport 27s. 6d., while Ribble Motor Services changed hands up to 37s. Higher dividend expectations kept B.E.T. 5s. "A" deferred units active around 46s. 3d.

Engineering and kindred shares were generally firm with Vickers at 57s. 3d. and Cammell Laird 5s. units 14s. 9d. The Metropolitan-Cammell Carriage & Wagon Co. Ltd., controlled jointly by Vickers and Cammell Laird, started the year with a record order book and established a new record in deliveries. There is no further news on the question of reacquiring the English Steel Corporation. Negotiations are still proceeding with the Realisation Agency. Cammell Laird has a strong financial position and apparently would not have to raise additional capital to repurchase the previous holding in English Steel. The City is wondering when the next public offer of denationalised steel shares will be made. It is assumed that either Stewarts and Lloyds or John Summers are next on the list. Guest Keen have receded in price to 55s. 6d. on some disappointment with the unchanged dividend. Babcock & Wilcox rallied to 56s. 3d. on attention drawn to the part the company is playing in plans for the commercial use of atomic energy.

There was again firmness among shares of locomotive builders and engineers with Beyer Peacock at 37s. 6d. and Charles Roberts 5s. shares 8s. 9d. Birmingham Carriage were 27s. 9d. and Hurst Nelson 42s. North British Locomotive were 15s. 9d. Vulcan Foundry eased a little to 23s. 9d. Gloucester Wagon 10s. shares changed hands around 17s. and Wagon Repairs 5s. around 13s. 4½d.